COURSE STRUCTURE
AND
DETAILED SYLLABUS
for

I Year and II Year

B. Tech CIVIL ENGINEERING (CE)

(Applicable for batches admitted from 2018-19)

DEPARTMENT OF CIVIL ENGINEERING
SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
(An Autonomous Institution approved by UGC and affiliated to JNTUH)
Yamnampet, Ghatkesar, Hyderabad - 501 301

SREENIDHI INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF CIVIL ENGINEERING

B.Tech Course Structure – Autonomous Regulation: 2018-19 (166 Credits)

[6 theory + 3 Lab structure & Professional Electives – 5 & Open Electives – 3]

I Year I Semester

Sr. No	Subject Code	Subject	L	T	P/D	C	Max Marks	
							CIE	SEE
1	7HC03	Chemistry	3	1	0	4	30	70
2	7FC01	Problem solving using C	3	0	0	3	30	70
3	7HC06	Engineering Mathematics – I	3	1	0	4	30	70
4	7BC01	Workshop / Manufacturing practices	1	0	0	1	30	70
5	7HC01	English (reading, listening, and writing)	1	0	0	1	30	70
6	7HC63	Chemistry lab	0	0	3	1.5	30	70
7	7FC71	Problem solving using C lab	0	0	3	1.5	30	70
8	7HC61	English (reading, listening, and writing) lab	0	0	2	1.0	30	70
9	7BC61	Workshop / Manufacturing practices Lab	0	0	3	1.5	30	70
10	7K261	Technical Seminar – I	0	0	2	1.0	30	70
11	7HC20	(Mandatory) Human Values and professional Ethics in Higher education	3	0	0	0	30	70
							Grade Evaluation	
		Total :	**14**	**2**	**13**	**19.5**	**330**	**770**

I Year II Semester

Sr. No	Subject Code	Subject	L	T	P/D	C	Max Marks	
							CIE	SEE
1	7HC04	Applied Physics	3	1	0	4	30	70
2	7K201	Engineering Mechanics (civil engineering)	3	1	0	4	30	70
3	7HC08	Engineering Mathematics – II	3	1	0	4	30	70
4	7BC02	Engineering Graphics & Design	1	0	4	3	30	70
5	7HC02	English (Oral communication skills)	1	0	0	1	30	70
6	7HC64	Applied Physics lab	0	0	3	1.5	30	70
7	7HC62	English (Oral communication skills) Lab	0	0	2	1	30	70
8	7K291	Technical Seminar – II	0	0	2	1	30	70
		Total:	**11**	**3**	**11**	**19.5**	**240**	**560**

II Year I Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	7BC04	Elements of Mechanical Engineering	2	0	0	2	30	70
2	7HC12	Engineering Mathematics- III	3	1	0	3	30	70
3	7K301	Introduction to Solid Mechanics	3	1	0	3	30	70
4	7K302	Surveying and Geomatics	3	1	0	3	30	70
5	7K303	Building Materials and Planning	3	0	0	2	30	70
6	7ZC01	Management Science & Financial Accounting	2	0	0	2	30	70
7	7K371	Mechanics of Solids LAB	0	0	3	1.5	30	70
8	7K372	Survey LAB	0	0	3	1.5	30	70
9	7K373	Computer Aided Drafting of Buildings LAB	0	0	3	1.5	30	70
10	7K391	Technical Seminar –III	0	0	2	1	100	-
		Total :	**16**	**3**	**11**	**20.5**	**370**	**630**

II Year II Semester

Sr. No	Subject Code	Subject	L	T	P/ D	C	Max Marks	
							CIE	SEE
1	7AC48	Electrical & Electronics Engineering	3	0	0	3	30	70
2	7K404	Mechanics of Materials	3	1	0	3	30	70
3	7K405	Fluid Mechanics	3	1	0	3	30	70
4	7K406	Construction Engineering and Management	3	1	0	3	30	70
5	7K407	Hydrology and Water resources engineering	3	0	0	**2**	30	70
6	7K408	Engineering Geology	3	0	0	2	30	70
7	7AC95	Electrical & Electronics Engineering Lab	0	0	2	1	30	70
8	7K471	Fluid mechanics Lab	0	0	4	2	30	70
9	7K472	Engineering Geology Lab	0	0	3	1.5	30	70
10	7K491	Technical Seminar –IV	0	0	2	1	100	-
11	7K488	Comprehensive Viva voce –I	-	-	-	1	50	50
12	7HC21	(Mandatory) Environmental Science and Technology	2	-	-	-	30	70
							Grade Evaluation	
		Total	**20**	**3**	**11**	**22.5**	**450**	**750**

1	2	3	4	5	6	7	8	9	10	11	12
X					X	X					

7HC03: CHEMISTRY

(Common to CSE, IT , ECM , CE & BT)

B. Tech I Year I Semester

L	T	P	C
3	1	0	4

Course Objectives:

1. To understand microscopic chemistry in terms of atomic and molecular orbitals
2. To learn the preparation and applications of commercial and conducting polymers and lubricant materials
3. To learn the industrial problems caused by water and municipal water treatment
4. To acquire knowledge about different types of batteries and their working mechanism
5. To develop the concepts and types of corrosion and the factors influence corrosion and to understand the control methods and protective coatings for metals
6. To learn the chemical reactions of drugs that are used in the synthesis of drug molecules

UNIT - I

Atomic and molecular structure (6L)

Molecular orbitals of diatomic molecules and plots of the multicentre orbitals. Equations for atomic and molecular orbitals. Energy level diagrams of diatomics. Pi-molecular orbitals of butadiene and benzene and aromaticity. Crystal field theory and the energy level diagrams for transition metal ions and their magnetic properties. Band structure of solids and the role of doping on band structures.

UNIT - II

Engineering materials (8L)

Plastics – Thermosetting and Thermoplastics, preparation, properties and engineering applications of plastics: PVC, Teflon, Bakelite. **Fibers:** Nylon 6,6 and Dacron.

Rubbers – natural and artificial rubber, vulcanization of natural rubber, Buna-S, Buna-N and their **engineering applications.**

Lubricants

Definition, classification and function of lubricants, Types of lubrication and mechanisms – Thick Film or Hydrodynamic Lubrication, Thin Film or Boundary Lubrication, Extreme Pressure Lubrication. Classification and properties of lubricants – Viscosity, flash and fire point, cloud and pour point and acid value. **Engineering applications.**

UNIT - III

Water Technology (8L)

(a) **Introduction**:- Hardness of water – types of hardness (temporary and permanent), calculation of hardness- Numerical problems. Estimation of hardness of water by EDTA Method.

(b) **Water for Industrial purpose**: Food, sugar, textile, paper and pharma industries, water for steam making characteristics of boiler feed water, boiler troubles- scale and sludge & Carry over (priming &foaming),boiler corrosion, caustic embrittlement.

(c) **Water Treatment**: Internal conditioning- phosphate, carbonate & calgon conditioning. External Treatment: Ion-exchange process. Desalination-reverse osmosis. Municipal water treatment-sedimentation, coagulation, filtration, disinfection-chlorination, ozonization. **Engineering applications: Methodology and working of mineral water plant for drinking purpose.**

UNIT - IV

Electrochemistry (8L)

Conductance – conductors (metallic and electrolytic), types of conductance – specific, equivalent and molar conductance – effect of dilution on conductance.

Free energy and emf, cell potentials, electrode potential (oxidation and reduction). Types of electrodes - redox electrode (quinhydrode electrode), metal – metal insoluble salt electrode and Ion selective electrode. Cell notation and cell reaction –Nernst equation and applications.

Engineering Applications.

Batteries : Types of batteries

(a) Primary batteries – Lechalanche cell (dry cell), Lithium cell

(b) Secondary batteries(Accumulators) – Lead acid battery, Lithium-ion battery

(c) Fuel cells- $H_2 – O_2$ fuel cell and MeOH-O_2 fuel cell-advantages and applications.

Engineering applications – future water powered car, Hydrogen production and storage.

UNIT - V

Corrosion and its prevention (7L)

Corrosion – basic concepts –types of corrosion, chemical, electrochemical corrosion (absorption of O_2 and evolution of H_2). Types of electrochemical corrosion – galvanic corrosion, pitting corrosion- factors affecting the rate of corrosion.

Cathodic protection – sacrificial anodic protection and impressed current cathodic protection method. Methods of metallic coatings-hot dipping (**tinning and galvanizing**), metal cladding (**Al cladding**), electroplating (**copper plating**) and electroless plating (**nickel plating**).

UNIT-VI

Organic reactions and drug molecules (5L)

Introduction : reactions involving substitution(S_N1, S_N2) addition to double bond(C=C), elimination(E^1 and E^2), oxidation (using $KMnO_4$, CrO_3), reduction (Hydrogenation by Ni/H_2, Pd/C)

Drugs : Definition, classification structure and applications of commonly used drug molecules- paracetamol, aspirin, ibuprofen and diphenhydramine (Benadryl)

Principles of spectroscopy and selection rules: Electronic spectroscopy. Fluorescence and its applications in medicine. Vibrational and rotational spectroscopy of diatomic molecules- **Applications**.

TEXT BOOKS:

1. Engineering Chemistry: by Jain & Jain ,Dhanapathrai Publications (2015)
2. Engineering Chemistry: by Thirumala Chary & Laxminarayana, Scitech Publications (2016)
3. Engineering Chemistry: by & B.Rama Devi, Prsanta Rath & Ch. Venkata Ramana Reddy, Cengage Publications (2016)

REFERENCE BOOKS:

1. Fundamentals of Molecular Spectroscopy by C. N. Banwell
2. Drugs by David Krupadanam- Universities Press
3. University chemistry by B. H. Mahan
4. Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane
5. Organic Chemistry: Structure and Function by K. P. C. Volhardt and N. E. Schore, 5th Edition http://bcs.whfreeman.com/vollhardtschore5e/default.asp

Course Outcomes

After completion of the course, the student will be able to:

1. Understand and analyse microscopic chemistry in terms of atomic orbitals, molecular orbitals and intermolecular forces.
2. Identify and differentiate conductivity of polymers, thermoplastic, thermosetting plastics and various lubricants.
3. Recognize and select the domestic and industrial problems caused by hard water and also learn about the municipal water treatment using various methods.
4. Understand and interpret the important fundamental concepts of electrochemistry and solve the problems related to batteries.
5. Differentiate the types of corrosion and methods used to prevent the corrosion.
6. Learn and implement synthesis of drug molecules and learn fundamentals of analytical techniques like electronic, vibrational and rotational spectroscopy.

1	2	3	4	5	6	7	8	9	10	11	12
X					X	X					

B. Tech I Year I semester

Problem Solving using C

(Common to All Branches)

Code: 7FC01

L	T	P	C
3	0	0	3

Course Outcomes:

After completion of this course student will learn

1. To formulate simple algorithms for arithmetic, logical problems and to translate the algorithms to programs(in C language)
2. To test and execute the programs and correct syntax and logical errors, to implement conditional branching, iteration and recursion
3. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
4. To use arrays, pointers and structures to formulate algorithms and programs.
5. To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
6. To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and simple integration.

UNIT I

Introduction to Programming: Introduction to components of a computer system (disks, memory, processor, where a program is stored and executed, operating system, compilers etc.)
Idea of Algorithm: steps to solve logical and numerical problems. Representation of Algorithm: Flowchart/Pseudocode with examples.
From algorithms to programs; source code, variables (with data types) variables and memory locations, Syntax and Logical Errors in compilation, object and executable code

UNIT II

History of C language, Characteristics of C language, Structure of C Language, C Tokens
Arithmetic expressions, Operator Precedence & **Associativity**
Conditional Branching and Loops
Writing and evaluation of conditionals and consequent branching and **Jumping Constructs**
Pretest and Post test, Iteration and loops (3 lectures)

UNIT III

Function: Functions (including using built in libraries), Parameter passing in functions, call by value, passing arrays to functions: idea of call by reference, **Storage Classes**
Recursion: Recursion, as a different way of solving problems. Example programs, such as Finding Factorial, Fibonacci series, Ackerman function etc.

UNIT IV

Arrays: Arrays (1-D, 2-D), Character arrays **Ragged Arrays and Dynamic Arrays**

Basic Algorithms Searching, Basic Sorting Algorithms (Bubble, Insertion and Selection), Finding roots of equations, notion of order of complexity through example programs (no formal definition required) Quick sort or Merge sort.

UNIT V

Pointers Idea of pointers, Defining pointers, Use of Pointers in self-referential structures, notation of linked list (no implementation) **Dynamic Memory allocation Functions**.
Strings: String Handling Functions.

UNIT IV

Structure: Structures, Defining structures and Array of Structures,
Nested Structures enum, typedef
File handling (only if time is available, otherwise should be done as part of the lab)
File Handling Functions, File Modes, File Operations

Suggested Text Books

(i) Byron Gottfried, Schaum's Outline of Programming with C, McGraw-Hill
(ii) E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill Suggested

Reference Books

(i) Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

1	2	3	4	5	6	7	8	9	10	11	12
X	X	X								X	

I Year B.Tech, Semester-I **Engineering Mathematics –I**
(Calculus and Matrix Theory)
(Common to EEE, ECE, ME, CE)

	L	T	P/D	C
Code: 7HC06	**3**	**1**	**0**	**4**

Pre Requisites: Mathematics Knowledge at Pre-University Level

Course Objectives: *To make the students to understand and expected to learn*

1. *Mean value theorems and their applications to the given functions, series expansions of a function.*
2. *Special functions such as Beta & Gamma functions and their properties, evaluation of improper integrals and the applications of definite integrals.*
3. *To test the convergence of a series and expansion of a function in sine and cosine terms.*
4. *Basic concepts of multivariable differential calculus.*
5. *About the linear system and some analytical methods for solution.p*
6. *Concept of Eigen values and Eigen vectors their properties and applications.*

Syllabus

UNIT*-I: *Calculus-1
Rolle's Theorem and Mean value theorems (Statements and Geometrical Interpretations if any); Taylor's and Maclaurin's theorems with remainders (without proof); Taylor's and Maclaurin series expansion.

UNIT-II: Calculus-2
Evolutes and involutes; Beta and Gamma functions and their properties; Evaluation of improper integrals, Applications of definite integrals to evaluate surface areas and volumes of revolutions.

UNIT-III: Sequences and series
Convergence of sequence and series, tests for convergence of a series. Fourier series, half range sine and cosine series, Parseval's theorem (without proof).

UNIT-IV: Multivariable Calculus (Differentiation)

Limit, continuity and partial derivatives, total derivative; Maxima, minima and saddle points; Method of Lagrange multipliers; Gradient, directional derivatives, Tangent plane; Concepts of divergence and curl with physical significance.

(PTO)

UNIT-V: Matrices-1
Inverse of a matrix by Gauss Jordan method, rank of a matrix; System of linear equations- Rank method/Gauss Elimination method. Symmetric, skew-symmetric and orthogonal matrices;

UNIT-VI: Matrices-2
Eigenvalues and Eigenvectors; Cayley - Hamilton Theorem, Hermitian, Skew-Hermitian and Unitary matrices, Diagonalization of matrices and Orthogonal transformation.

Text Books:

(i) R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.
(ii) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.
(iii) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.
(ii) B.S. Grewal, Elementary Engineering Mathematics, Khanna Publishers
(iii) C Sankaraiah, A Text book of Engineering Mathematics – I, VGS Book Links
(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

Course Outcomes: *After the course completion the students will be able to*

1. *Verify the mean value theorems and also express the given function in series form using Taylor's theorem.*
2. *Solve the problems using special functions; evaluate surface areas and volumes of revolutions.*
3. *Determine the convergence, divergence or oscillating nature of a series and express the function as trigonometric series.*
4. *Compute the extreme values of a function defined with and without constraints.*
5. *Check the consistency or inconsistency of a linear system and ability to solve real time problems.*
6. *Calculate the Eigen values and Eigen vectors of a matrix and their application for orthogonal transformation.*

1	2	3	4	5	6	7	8	9	10	11	12
X		X		X							

WORKSHOP/MANUFACTURING PRACTICES (THEORY)

B.Tech I year I sem (CSE, ECE, IT & CE) II sem (EEE, ECE & ME)

L	T	P	C
1	0	0	1

Code: 7BC01

Course Objectives:

Upon completion of this course, the students will gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate components using different materials.

COURSE OUTCOMES:

1) To understand various basic tools to perform simple joints using metal and wood.
2) To understand the principle of various electrical and electronic appliances and their applications.
3) To understand the manufacturing process of welding, casting and tin smithy and their applications.
4) To understand the operation of basic as well as advanced machines used for fabrication of Metals, Plastics and Glass.

Theory: In theory classes the following syllabus is to be covered in 10hrs using PPTS and Videos (Elementary treatment only)

1. Fitting & Power Tools
2. Electrical & Electronics Appliances
3. Carpentry
4. Plastic molding & Glass Cutting
5. Metal Casting
6. Metal Joining: Arc & gas welding and brazing
7. Metal forming
8. Machining
9. Advanced manufacturing methods: (Micro machining, USM,ECM,EDM)
10. CNC machining & Additive Manufacturing

Suggested Text/Reference Books:

1 Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.

2.Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

ENGLISH (Reading, Listening and Writing)

Course code: 7HC01

Branches: ECM, CSE, IT and Civil (I Year I Semester) **L T P Credits**
ECE, EEE and Mech (I Year Sem-II) **1 0 0 1**

1	2	3	4	5	6	7	8	9	10	11	12
							X	X	X		X

Course Objectives: The students

- acquire knowledge on various types of listening techniques, barriers and benefits of listening
- recognize the speech sounds and learn the intonation patterns
- learn various vocabulary patterns
- develop the ability to structure and punctuate the sentences
- learn different reading techniques
- learn different writing skills

Unit-I : Listening & Phonology

1.1 Importance of Listening;

1.2 Introduction to Speech Sounds

1.3 Vowels, Diphthongs, Consonant Sounds

Unit-II: Stress & Intonation

2.1 Significance of word accent

2.2 Intonation Patterns

Unit-III: Vocabulary

3.1 Word Roots - Affixes: Prefixes and Suffixes

3.2 Homophones, Homonyms, Homographs

3.3 Synonyms – Antonyms

3.4 One word substitutes

3.5 Idioms and Phrases

Unit-IV: Basic Writing Skills

4.1 Sentence Structure

4.2 Kinds of Sentences

4.3 Punctuation in Writing

Unit-V : Reading Comprehension

5.1 Skimming and Scanning

5.2 Prediction Techniques and Inferring

5.3 Note Making

Unit-VI: Writing Skills

6.1 Paragraph Writing

6.2 Letter Writing

Course Outcomes: At the end of the course the students will be able to

- understand and differentiate different types of listening techniques used to interact with real world problems
- differentiate the speech sounds and improve their accent and modulation while speaking
- understand and illustrate different word roots, word derivatives – synonyms, antonyms and word inflections
- discriminate a variety of sentence types, their structure and use punctuations
- get acclimatized to reading strategies and note making.
- develop proficiency in writing and preparing resume

Suggested Readings:

(i) *English grammar just for you* Rajeevan Karal, Oxford publications
(ii) *Practical English Usage.* Michael Swan. OUP. 1995.
(iii) *Remedial English Grammar.* F.T. Wood. Macmillan.2007
(iv) *On Writing Well.* William Zinsser. Harper Resource Book. 2001
(v) *Study Writing.* Liz Hamp-Lyons and Ben Heasly. Cambridge University Press. 2006.
(vi) *Communication Skills.* Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
(vii) *Learn to Write* by Dr. G. Varalakshmi, Kindle Edition 2016
(viii) *A practical course for developing writing skills in English* by J.K. Gangal, PHI Learning Pvt Ltd.

1	2	3	4	5	6	7	8	9	10	11	12
X					X						

L	T	P	C
0	0	3	1.5

7HC63: CHEMISTRY LABORATORY
B. Tech I Year I Semester
(Common to CSE, IT , ECM , CE & BT)

Course Objectives:

The student will be able to learn:

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification /acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Thin layer chromatography

List of Experiments

1. Preparation of coordination complex NiDMG Complex
2. Determination of surface tension
3. Determination of viscosity
4. Saponification/acid value of an oil
5. Ion exchange column for removal of hardness of water / Estimation of Hardness of water by EDTA Method
6. Determination of chloride content of water
7. Determination of cell constant and conductance of solutions (HCl Vs NaOH / Mixture of acid Vs Strong base)
8. Potentiometry - determination of redox potential and emf ($FeSO_4$ Vs $KMNO_4$ / HCl Vs NaOH)
9. Determination of the rate constant of acid catalyzed hydrolysis of methylacetete
10. Synthesis of a polymer- Thiakol rubber / Urea-Farmaldehyde resin
11. Synthesis of a drug- Aspirin
12. Thin layer chromatography

Course Outcomes

After completion of the course, the student will be able to learn:

1. Methods to prepare inorganic complexes.
2. The process to determine surface tension of different liquids using stagnometer
3. The process to determine viscosity of lubricants by using redwood viscometer.
4. How to find acid value of an oil.
5. The principle and determination of Hardness of a water sample.
6. The methods to estimate amount of chlorine in water.
7. To determine unknown concentration of acid by using conductometric method.
8. To determine unknown concentration of acid by using potentiometric method.
9. Estimate rate constants of reactions from concentration of reactants/products as a function of time.
10. Methods to prepare industrially important polymers.
11. The method of preparation for organic compounds.
12. To separate the organic compounds from their mixture by using Thin layer chromatography.

1	2	3	4	5	6	7	8	9	10	11	12
	X			X							

B. Tech I Year I semester

Problem Solving using C LAB

(Common to All Branches)

Code: 7FC71	**L**	**T**	**P**	**C**
	0	**0**	**3**	**1.5**

Course Outcomes:

After completion of this course student will learn

1. To formulate the algorithms for simple problems
2. To translate given algorithms to a working and correct program
3. To be able to correct syntax errors as reported by the compilers
4. To be able to identify and correct logical errors encountered at run time
5. To be able to write iterative as well as recursive programs
6. To be able to represent data in arrays, strings and structures and manipulate them through a program
7. To be able to declare pointers of different types and use them in defining self referential structures.
8. To be able to create, read and write to and from simple text files.

[The laboratory should be preceded or followed by a tutorial to explain the approach or algorithm to be implemented for the problem given.]

1. Unit I (Cycle 1)

1. Write an algorithm for converting a given Celsius temperature to its equivalent Fahrenheit temperature and draw a flowchart.
2. Write an algorithm to find the largest of three given numbers and draw a flowchart.
3. Write an algorithm and draw a flowchart for finding the roots and nature of roots of a quadratic equation, given its coefficients.
4. Write an algorithm and flowchart for finding the first n Fibonacci numbers, give n.

2. Unit II (Cycle 2)

1. Write an algorithm, flowchart, and C program for:
2. Finding the area and circumference of a circle of given radius.
3. Finding the volume of a sphere of given radius.
4. Finding the lateral surface area of a right circular cone of given base radius and height.
5. Finding selling price of an item, given its cost price and profit percent.
6. Finding the interest on a given principal for a given period of time at a given rate of per year.
7. Write a C program to display all the sizes of data types in C.
8. Write a C program to display a given decimal integer into an equivalent octal number and hexadecimal number using %o and %x in printf function.

3. Unit II (Cycle 3)

1. Write a C program to find the roots and nature of the roots of a quadratic equation, given its coefficients.

2. Write a C program for finding the largest of three given numbers.
3. A salesman gets a commission of 5% on the sales he makes if his sales is below Rs.5000/- and a commission of 8% on the sales that exceeds Rs.5000/- together with Rs.250/-. Write an algorithm or a flowchart and develop C program for computing the commission of the salesman, given his sales.

4. Unit III (Cycle 4)

1. Write three C programs to print a multiplication table for a given number using while, do-while, and for loops.
2. Write a C program to compute the sum of:
3. $1+x+x^2+x^3+\ldots\ldots\ldots\ldots+x^n$, given x and n.
4. 1! + 2! + 3! + . . . + n!, given n.
5. $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10! + \ldots$ to n terms where the n^{th} term becomes less than 0.0001.

5. Unit III (Cycle 5)

1. Write a C program in the menu driven style to perform the operations +, -, *, /, % between two given integers.
2. Write a C program to find the largest and the least of some numbers given by the user.
3. Write a C program to find the sum of the digits of a positive integer.

6. Unit III (Cycle 6)

1. Write C functions for the following:
   - **a)** A function that takes an integer n as argument and returns 1 if it is a prime number and 0 otherwise.
   - **b)** A function that takes a real number x and a positive integer n as arguments and returns x^n.
   - **c)** A function that takes a positive integer n as an argument and returns the n^{th} Fibonacci number.
2. Using recursion write C functions for the following:
   - **a)** Factorial of a non-negative integer n.
   - **b)** Number of combinations of n things taken r at a time.
   - **c)** Greatest Common Divisor of two integers.
   - **d)** Least Common Multiple of two integers.

7. Unit III (Cycle 7)

- **a)** Write a menu driven style program to compute the above functions (cycle 6) on the choice of the function given by the user.
- **b)** Define macros for the following and use them to find sum of the squares of the minimum and maximum of two given numbers.
  1. Larger of two numbers.
  2. Smaller of two numbers.
  3. Sum of the squares of two numbers.
- **c)** Write a program to generate Pascal's triangle.

d) Write a program to count the number of letters, words, and lines in a given text.

8. Unit IV (Cycle 8)

1. Write a program to store the numbers given by the user in an array, and then to find the mean, deviations of the given values from the mean, and variance.
2. Write a C program to initially store user given numbers in an array, display them and then to insert a given number at a given location and to delete a number at a given location.
3. Write a program to store user given numbers in an array and find the locations of minimum and maximum values in the array and swap them and display the resulting array.

9. Unit IV (Cycle 9)

1. Write a C program to implement the operations of matrices – addition, subtraction, multiplication.
2. Write a program to find whether a given matrix is symmetric, lower triangular, upper triangular, diagonal, scalar, or unit matrix.

10. Unit V (Cycle 10)

1. Write a function to swap two numbers.
2. Write a function to compute area and circumference of a circle, having area and circumference as pointer arguments and radius as an ordinary argument.

11. Unit VI (Cycle 11)

1. Define a structure for complex number. Write functions on complex numbers (addition, subtraction, absolute value, multiplication, division, complex conjugate) and implement them in a menu driven style.
2. Define a structure point. Write a program to find the distance between two points.
3. Define a structure student having members roll no., name, class, section, marks. Create an array of 10 students give the data and find the average marks, section-wise.

12. Unit VI (Cycle 12)

1. Write a program to:
   a) Create a file by the name given by the user or by command line argument and add the text given by the user to that file.
   b) Open the file created above and display the contents of the file.
   c) Copy a file into some other file, file names given by the user or by command line arguments.
   d) Append a user mentioned file to another file.
   e) Reverse the first n characters of a file.

ENGLISH (Reading, Listening and Writing) Lab

Course code: 7HC61

Branches: ECM, CSE, IT and Civil (I Yr Sem-I) **L T P Credits**

ECE, EEE and Mech (I Yr Sem-II) **0 0 2 1**

1	2	3	4	5	6	7	8	9	10	11	12
							X	X	X		X

Course Objectives: The students

- acquire knowledge on various types of listening techniques, barriers and benefits of listening
- recognize the speech sounds and learn the intonation patterns
- learn various vocabulary patterns
- develop the ability to structure and punctuate the sentences
- learn different reading techniques
- learn different writing skills

Unit-I : Practice sessions on
Listening to Sounds of English, Vowels, Diphthongs, Consonant
Listening to differentiate minimal pairs, pronunciation patterns

Unit-II: Practice sessions on
word and sentence stress ,stress shift, strong and weak verbs
Intonation Patterns

Unit-III: Exercises on Word Roots
Affixes : Prefixes and Suffixes
Identifying Homophones,
Homonyms, Homographs
Synonyms - Antonyms
One word substitutes
Idioms and Phrases

Unit-IV: Exercises on
Punctuation and Spelling
Error Identification in Sentences
Conversion of Sentences

Unit-V : Practice sessions on
Using passages for skimming and scanning
Note Making using Texts
Reading Comprehension using different techniques

Unit-VI: Exercises on
Paragraph Writing using hints/guided Paragraphs
Writing Letters

Course Outcomes: At the end of the course the students will be able to

- understand and differentiate different types of listening techniques used to interact with real world problems

- differentiate the speech sounds and improve their accent and modulation while speaking
- understand and illustrate different word roots, word derivatives – synonyms, antonyms and word inflections
- discriminate a variety of sentence types, their structure and use punctuations
- get acclimatized to reading strategies and note making.
- develop proficiency in writing and preparing resume

1	2	3	4	5	6	7	8	9	10	11	12
				X				X			

WORKSHOP/MANUFACTURING PRACTICES (LAB)

Code: 7BC61

Course Objectives:

1) To identify various basic tools to perform simple joints using metal and wood.
2) To recognize various electrical and electronic and their applications.
3) To understand the manufacturing process of welding , casting and tinsmithy and apply the processes in making simple products.
4) To understand and operate basic machines for fabrication of Metals, Plastics and Glass.
5) To understand the functions and parts of commonly used domestic appliances.

COURSE OUTCOMES:

1. After completion of the course , the student will be able to fabricate components with their own hands.
2. Assemble different components and produce small devices of their interest.

Work shop and Manufacturing Practices: Minimum of 10 experiments out of twelve given here under are to be completed

LIST OF EXPERIMENTS

S.No	Trades	List of Experiments
1	Fitting Shop	**1**. Preparation of T-Shape Work piece **2.** Preparation of U-Shape Work piece which contains: Filing, Sawing, Drilling, Grinding.
2	Carpentry	3.Practice of Cross Half lap joint 4. Practice of Half lap Dovetail joint
3	Electrical & Electronics	5. One lamp one switch Practice 6. Stair case wiring: Practice
4	Welding shop (Arc & Gas)	Demonstration of Gas and Resistance welding 7. Practice of Lap and Butt joint using Arc welding
5	Casting	8.Preparation of mould by using split pattern 9. Mould preparation and pouring of molten metal.
6	Tin Smithy	paration of Rectangular Tray & Square box
7	Machine Shop	11. Demonstration of turning , Drilling and Reaming operations
8	Plastic molding & Glass Cutting	12 a) Demonstration of Injection Moulding b) Demonstration of Glass Cutting with hand tools
9	Domestic Appliances	13.Demonstration of Fans, Mixers, Air blower, Iron box, Rice cooker, Emergency light etc
10	Lab project	14. Making various components and / or assembling the components which can be useful in domestic / engineering applications

1	2	3	4	5	6	7	8	9	10	11	12
								x	x		x

Syllabus for B. Tech I Year I Semester
Civil Engineering
TECHNICAL SEMINAR –I

Code: 7K261

L	T	P	C
-	-	2	1

Course Objective :
Develop ability to be a public speaker with the aid of Power Point Presentations. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to the end of 9th week	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

1	2	3	4	5	6	7	8	9	10	11	12
X				X			X				

B.TECH. I YEAR I SEM (Mechanical) & II SEM (Civil)

		L	T	P	C
Code: 7HC04	**APPLIED PHYSICS**	**3**	**1**	**0**	**4**

Course Objectives

- To understand basic fundamentals of crystallography, crystal structures, their properties
- To understand the various defects of a crystal and X-ray diffraction techniques to analyze a crystal structure.
- To make the students to widen the conceptual understanding of the fundamental principles of interference and diffraction (wave optics)
- To understand the basic concepts of normal light, Laser and its applications and to know about the fundamentals of radioactivity and its applications.
- To know the various types of vibrations like periodic, vibrating strings, ultrasonics, magnetostriction, piezo-electricity, NDT.
- To discuss about the nano-technology, preparation techniques and characterization (XRD, SEM & TEM), CNTs

Unit:1

Crystallography and Crystal structures and their relative properties

Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC
and HCP Structures. Crystal Planes, directions and Miller Indices, Inter Planar Spacing of Orthogonal Crystal Systems.

Unit:2

Crystal Defects and X-ray diffraction

Point Defects - Vacancies, Substitutional, Interstitial, Frenkel and Schottky Defects-Calculation of concentrations, Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector.
X-ray Diffraction: Bragg's Law, Laue method and Powder Method.

Unit:3

Wave optics and applications

Interference: Introduction, Superposition of waves, Young's double slit experiment, Intensity calculation, fringe width, Interference in thin films due to reflection of light, Newton's rings. Applications: Calculation of Refractive Index of liquid, Thickness of glass plate.

Diffraction: Introduction, Plane diffraction grating (Qualitative), Theory of plane transmission grating, Resolving power of a grating - Application; calculation of wavelength of spectral light by using grating.

Unit:4

Lasers

Characteristics of LASER, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, pumping, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them and significance, Ruby Laser, Helium-Neon Laser, Semiconductor Diode Laser, Applications of Lasers in medicine and engineering.

Nuclear Energy: Radioactivity, Nuclear binding energy, Nuclear fission, Nuclear fusion, □, β, γ rays decay, Geiger-Muller counter and practical applications of nuclear physics.

Unit:5

Vibrations and ultrasonics

Undamped vibrations and its solutions (quantitative), Damped, Forced vibrations (qualitative) and Resonance. Applications: Physical Pendulum, Torsional Pendulum and Compound Pendulum, Vibrating strings. Production and properties of ultrasonics by magnetostriction effect and piezoelectric effect. Applications of ultrasonics, special reference to NDT.

Unit:6

Nanotechnology

Origin of Nanotechnology, Nano Scale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication, Sol-gel, Precipitation, Chemical vapor Deposition(CVD); Top-down Fabrication; Thermal evaporation, Ball Milling, Characterization of Nano materials (XRD&TEM), carbon nano tubes(CNTs), Applications of Nano Materials.

Text Books:

1.B.K. Pandey & S. Chaturvedi Engineering Physics, Cengage Learning

2.D.K. Bhattacharya and Poonam Tandon, OXFORD university press.

Reference Books:

1. Charles Kittel, Introduction to Solid State Physics, John Wiley Publisher
2. Dekker, Solid State Physics
3. Halliday and Resnick, Physics
4. Engineering Mechanics, 2nd ed. – MK Harbola
5. Theory of Vibrations with Applications – WT Thomson
6. S.O. Pillai, Solid State Physics
7. P K Palanisamy, Engineering Physics, Sitech Publications
8. A. Ghatak – Optics
9. Physical Metallurgy principles 4th edition-Reza Abbaschian Lara Abbaschian Robert E. Reed-Hill

Course Outcomes

After completing the course, students will be able to

- Get the knowledge to classify the crystal structures, their parameters and draw the various crystal planes using Miller indices.
- Understand and analyze the defect type, describe the crystal structure using the various X-ray diffraction techniques.
- Analyze the wave nature and its types, superposition principle, differentiation between interference, diffraction and their applications
- Explain about emission, its types, laser principle, types, working and its applications and also to understand the radioactivity, fusion & fission, alpha, beta and gamma rays decay and its applications.
- Understand about the vibrations, periodic motion and apply the knowledge of ultrasonic, non destruction testing, magnetostriction, piezo-electricity.
- Summarize nano & bulk concepts, surface to volume ratio, quantum confinement, CNTs and preparation methods (physical & chemical), analysis the techniques like XRD, SEM, TEM

1	2	3	4	5	6	7	8	9	10	11	12
X								X			X

Syllabus for B. Tech I Year II Semester
Civil Engineering
Engineering Mechanics (For Civil Engineering)

Code: 7K201

L	T	P	C
3	1	0	4

Course Objective :

1. To make the students understand the concepts of Force system, Resultant of Force systems, Components of Force, Moments, and Couples in plane and in space and Free body diagrams
2. To introduce the students the concepts of friction, including types of friction, and analysis of simple trusses and frames and give them a foundation on these topics.
3. To make the students understand the concepts of Centroid and Area and Mass Moments of Inertia and make them learn how to calculate the centroid of various geometrical shapes and Area and Mass Moments of Inertia of different shapes and objects.
4. To make the students learn the principles of virtual work and energy method in analyzing and solving equilibrium problems involving rigid bodies acted upon by various forces
5. To make the students learn particle kinematics and kinetics concepts involving rectilinear and curvilinear motions in different coordinate systems
6. To make the students learn rigid body dynamics involving plane motion including rotation and application of work energy principle in plane motion of connected bodies.

Course Outcomes:

After completing the course, students will be able:

1. to analyze a system of forces in plane or in space, sketch free body diagrams and use equations of equilibrium to solve problems dealing with coplanar or spatial forces.
2. to analyze and solve problems involving basic frictional forces.
3. to analyze and solve simple trusses and frames using method of sections and method of joints
4. to determine the centroid, area and mass Moments of Inertia for various geometrical shapes and objects
5. to able use principle of virtual work and energy equation in solving problems involving rigid bodies acted by various forces including friction forces.
6. to apply the equations of rectilinear and curvilinear motions to predict the geometry of motion for a given system of forces
7. to apply the equations of plane motion and rotation involving rigid bodies to problems involving applied forces and ensuing motion of the bodies.

UNIT-I

Introduction to Engineering Mechanics: Force Systems, Basic concepts and axioms, Rigid Body equilibrium, System of Forces, Coplanar Concurrent Forces, Lami's theorem, Components in Space – Resultant of Force System; Moment of Forces and its Application; Varignon's

principle; Couples; Equilibrium of System of Forces, Free body diagrams, Equations of Equilibrium of Coplanar Systems and Spatial Systems; Static Indeterminacy.

UNIT-II

Friction: Types of friction, Limiting friction, Laws of Friction, Static and Dynamic Friction; Motion of Bodies, wedge friction, Belt Friction, screw jack & differential screw jack.

Basic Structural Analysis: Equilibrium in three dimensions; Method of Sections; Method of Joints; Simple Trusses; Frames.

UNIT-III

Centroid and Centre of Gravity: Centroid of simple figures from first principle, centroid of composite sections; Centre of Gravity and its implications;

Moment of Inertia: Area moment of inertia- Definition, Moment of inertia of plane sections from first principles, Theorems of moment of inertia, Moment of inertia of standard sections and composite sections; Mass moment inertia of circular plate, Cylinder, Cone, Sphere, Hook.

UNIT-IV

Virtual Work and Energy Method: Virtual displacements, principle of virtual work for particle and ideal system of rigid bodies, degrees of freedom. Active force diagram, systems with friction, mechanical efficiency. Conservative forces and potential energy (elastic and gravitational), energy equation for equilibrium. Applications of energy method for equilibrium. Stability of equilibrium.

UNIT-V

Particle Dynamics: Rectilinear motion; Plane curvilinear motion (rectangular, path, and polar coordinates). 3-D curvilinear motion; Relative and constrained motion; Newton's Second law (rectangular, path, and polar coordinates). Work-kinetic energy, power, potential energy. Impulse-momentum (linear, angular); Impact (Direct and oblique).

UNIT-VI

Introduction to Dynamics of Rigid Bodies: Basic terms, general principles in dynamics; Types of motion, Instantaneous centre of rotation in plane motion and simple problems; D'Alembert's principle and its applications in plane motion and connected bodies; Work energy principle and its application in plane motion of connected bodies; Kinetics of rigid body rotation;

TEXT BOOK

1. K. Vijay Kumar Reddy and J. Suresh Kumar, Singer's Engineering Mechanics, BS Publications, Hyderabad, 2011

REFERENCES

1. Engineering Mechanics by S.P. Timoshenko, D.H.Young & J.V.Rao, Tata McGraw Hill Publishers,4th Edition,2010
2. Engineering Mechanics by S.S. Bhavikatti, Newage International Publishers,2012
3. Engineering Mechanics (Statics) by J.L.Meriam & L.G.Kraige, Wiley Publishers, 6th Edition,2006
4. Engineering Mechanics by A.K.Tayal, Umesh Publications,13th Edition,2010
5. Engineering Mechanics by R.K. Rajput, laxmi Publications,1998

1	2	3	4	5	6	7	8	9	10	11	12
X	X	X								X	

I Year B.Tech, Semester-II

Engineering Mathematics – II

(Advanced Calculus and Complex Analysis)
(Common to EEE, ECE, ME & CE)

	L	T	P/D	C
Code: 7HC08	**3**	1	**0**	**4**

Pre Requisites: Engineering Mathematics-II

Course Objectives: *To make the students to understand and expected to learn*

1. *Multiple integration and its applications also acquire knowledge on curvilinear coordinate system.*
2. *Various analytical methods to solve first order first degree and also the equations not of first degree ordinary differential equations.*
3. *Methods to solve higher order ordinary differential equations.*
4. *Series solution of second order ordinary differential equations with variable coefficients.*
5. *Basic concepts of Complex Analysis and conformal mapping and their properties.*
6. *Series expansion of a function using Taylor's and Laurent's series. Evaluation of definite integrals and improper integrals.*

Syllabus

UNIT - I: Multivariable Calculus (Integration (12 L)

Multiple Integration: Double integrals (Cartesian), change of order of integration in double integrals, Change of variables (Cartesian to polar), Triple integrals (Cartesian), Applications: areas and volumes. Line integrals, Surface integrals, Volume Integrals, Green, Gauss divergence and Stokes theorems (without proofs).

UNIT - II: First order ordinary differential equations: (10 L)

Exact, equations reduced to exact; linear and Bernoulli's equations; Orthogonal Trajectories, Newton's Law of Cooling, Law of natural Growth/Decay.

UNIT - III: Ordinary differential equations of higher order: (10 L)

Higher order linear differential equations with constant coefficients-Standard types of finding P.I, method of variation of parameters, Cauchy-Euler equation.

(PTO)

UNIT - IV: Series Solutions to Second Order Ordinary Differential Equations: (8 L)

Legendre polynomials, Bessel functions of the first kind and their properties, Recurrence relations (without proof), generating function (without proof), related problems.

UNIT - V: Complex Variable – Differentiation: (8 L)

Differentiation, analytic functions, Cauchy-Riemann equations, harmonic functions, finding harmonic conjugate. Conformal mapping: Translation, Inversion, Rotation and Magnification, Invariance of circles and cross ratio-Determination of bilinear transformation – mapping three given points.

UNIT - VI: Complex Variable – Integration: (12 L)

Cauchy - Integral theorem (without proof), Cauchy Integral formula (without proof), singularities, zeros of analytic functions, Taylor's series, Laurent's series; Residues, Cauchy Residue theorem (without proof), Evaluation of definite integral involving sine and cosine.

Text Books:

(i) R K Jain and S R K Iyengar Advanced Engineering Mathematics, Narosa Publications.

(ii) B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.

(iii) Erwin kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.

Reference Books:

(i) N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint, 2008.

(ii) Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

(iii) Engineering Mathematics, Srimanta Pal, OXFORD university press.

(iv) G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.

Course Outcomes: *After the course completion the students will be able to*

1. *Solve the problems of multiple integration and apply these concepts for finding the parameters like surface area, volume, center of mass and centre of gravity.*
2. *Find the solutions of first order first degree and not of first degree differential equations and their applications such as Newton's law of cooling, Natural growth and decay.*
3. *Identify and solve higher order ordinary differential equations with constant coefficients using some standard methods and also their applications in LCR circuits.*
4. *Write the solutions of Legendre and Bessel's equations s series.*
5. *Understand the concept of analyticity of a function; solve the problems on conformal mapping.*
6. *Express the functions of a complex variable in series form also able to evaluate definite and improper integrals using complex integration*.

1	2	3	4	5	6	7	8	9	10	11	12
X				X					X		

ENGINEERING GRAPHICS & DESIGN

B.Tech I year I sem (EEE, ECE & ME) II sem (CSE, ECE, IT & CE)

Code : 7BC02

L	T	P/D	C
1	0	4	3

Course objectives:

1: To teach students the basic principles of Engineering graphics and instruments used
2: To introduce the concept of projections in drawing and its applications for simple drawing entities
3: To impart the knowledge of various types of solids and their projections in different position wrt principle planes
4: To teach the concept of sections of solids and their applications
5: To develop a clear understanding of the basic principles involved in three dimensional Engineering drawings.
6: To train the students for the extraction of multiple views from a solid model using AutoCAD

Course outcomes

After completing this course, the student will able to:

1) Get familiar to use the instruments to solve the engineering problem and draw various type of curves used in engineering
2) Understand and Implement Orthographic projections and draw projections of simple drawing entities such as points Lines, and Planes
3) Draw projections of different types of regular solids in various positions wrt principal planes of projection
4) Draw Sections of various Solids including Cylinders, cones, prisms and pyramids and draw the developments of these solids and their sections.
5) Construct Isometric Scale, Isometric Projections and Views and convert 3D views to 2D orthographic views
6) Understand from basic sketching through 2D and 3-D solid modeling using computer aided design (CAD) software

UNIT – I

Introduction to Engineering Drawing: Drawing Instruments and their uses, types of lines, Types and uses of pencils, Lettering, Rules of dimensioning.

Curves used in Engineering Practice and their Constructions:

Conic Sections including Rectangular Hyperbola - General method, Cycloid, Epicyloid, and Involutes of circles.

UNIT – II

Orthographic Projection: Principles of Orthographic Projections – Conventions – First angle and third angle projections (however all drawing exercises must be in first angle only) - Projection of Points, Lines - Inclined to both planes, Projections of regular Plane, inclined planes - Auxiliary views.

UNIT –III

Projections of Regular Solids: Projections of Regular Solids: Prisms, Cylinders, Pyramids, Cones – Axis inclined to both planes, Auxiliary views.

UNIT –IV

Sections and sectional views of Solids: Sections and Sectional views of Right Regular Solids – Prism, Cylinder, Pyramid, Cone – Auxiliary views.

Development of Surfaces: Development of Surfaces of Right Regular Solids – Prisms, Cylinders, Pyramids, Cones and their sections.

UNIT – V

Isometric Projections/views: Principles of Isometric Projection – Isometric Scale – Isometric Views – Conventions – Isometric Views of Lines, Plane, Simple Solids. Conversion of isometric views to orthographic views.

UNIT –VI

Overview of Computer Graphics : Demonstrating features of the CAD software - The Menu System, Toolbars, , Dialog boxes and windows, Drawing entities - lines, circles, arcs etc and editing commands, Dimensioning of objects,2D drawings-simple exercises , 3D wire-frame and shaded solids- Commands, Boolean operations.

Text/Reference Books:

(i) Bhatt N.D., Panchal V.M. & Ingle P.R., (2014), Engineering Drawing, Charotar Publishing House

(ii) Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education

(iii) Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication

(iv) Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers

(v) AUTOCAD Software Theory and User Manuals

ENGLISH (Oral Communication Skills)

Course code: 7HC02

Branches: ECE, EEE and Mech (Sem-I) **L T P Credits**

ECM, CSE, IT and Civil (Sem-II) **1 0 0 1**

1	2	3	4	5	6	7	8	9	10	11	12
							X	X	X		X

Course Objectives: The course will develop the students' ability to

- integrate listening and speaking skills
- communicate effectively
- speak effectively on a given topic
- master the art of presentation
- interact with peers in a group discussion

Unit-I : Listening Skills

1.1 Importance of Listening;

1.2 Types of listening

1.3 Barriers to Listening

1.4 Benefits of Listening

Unit-II: Oral Communication Skills -I

2.1 Types of Sentences – Assertive, Interrogative, Imperative and Exclamatory

2.2 Difference between Pauses, Gaps

2.3 Question Tags

Unit-III: Inter personal Communication

3.1. Self introduction , introducing others and Greetings

3.2 Asking and Giving Directions

3.3 Role Plays & Situational Dialogues

Unit-IV: Oral Communication Skills -II

4.1 Speaking on a particular topic - JAM

4.2 Use of cohesive devices in speaking

4.3 Common Errors in Spoken English

Unit-V: Presentation skills

5.1 Presentation Skills

5.2 Information Transfer

Unit-VI: Group Discussion

6.1 Importance of Group Discussion

6.2 Do's and Don'ts of Group Discussion

Course Outcomes: After completing the course students will be able to

- understand, analyze and respond to the audience by listening effectively
- acquire the articulation of different types of sentences by practicing pause patterns and question tags.
- translate and demonstrate self, participate effectively in activities like JAM, extempore
- express and deliver a presentation on the given topic through role plays and situational dialogues
- implement English language to meet the standards of corporate and real world in a group.

Suggested Readings:

(i) *Step by step learning language and life skills* by Niruparani, Jayasree Mohanraj, Indira, Sailakshmi Pearson Publishers
(ii) *Communication skills for technical students* by TM Farhathullah, Orient Black swan Publications
(iii) *English for technical Communication* by K.R. Lakshmi Narayan , Scitech Publications
(iv) *Practical English Usage*. Michael Swan. OUP. 1995.
(v) *Communication Skills*. Sanjay Kumar and Pushp Lata. Oxford University Press. 2011.
Exercises in Spoken English. Parts. I-III. CIEFL, Hyderabad. Oxford University Press

1	2	3	4	5	6	7	8	9	10	11	12
X		X									

B.TECH. I YEAR I SEM (Mechanical) & II SEM (Civil)

		L	T	P	C
Code: 7HC64	**APPLIED PHYSICS LAB**	**-**	**-**	**3**	**1.5**

Course Objectives

- To explain about magnetic induction, Biot-Savart principle - Magnetism
- Explain about the acceleration due to gravity and radius of gyration and periodic vibrations-Compound Pendulum - Vibrations
- To understand the rigidity modulus-Torsional pendulum - Vibrations
- To understand about the ionizing radiation by using the Geiger–Muller counter – Nuclear energy.
- To understand the transverse laws of vibrations-Sonometer - Resonance
- To explain the electrically vibrating the tuning fork by using Melde's experiments – Electromagnetism.
- Discuss the dispersive power of prism-minimum deviation method - Light
- Explain the formation of Newton's rings-interference - Light
- Discussion of diffraction pattern using the grating - LASER
- To study the LED characteristics and forward resistance – Semiconductor devices.
- Explaining about the electrical resonance by using the LCR circuit – Electrical / Semiconductor devices.
- To know the time constant of RC circuit - Electrical / Semiconductor devices.

List of Experiments

1. Determination of magnetic induction flux density along the axis of a current carrying circular coil using Stewart and Gee's experiment.
2. Determination of acceleration due to gravity and radius of gyration using compound pendulum.
3. Determination of rigidity modulus of a given wire material using the Torsional pendulum.
4. Studying the characteristics of Geiger–Muller counter and verifying the inverse square law.
5. Verification the transverse laws of stretched strings by using the Sonometer.
6. Determination of frequency of an electrically vibrating tuning fork using the Melde's experiment
7. Calculation of dispersive power of a given material of prism by using

Spectrometer in minimum deviation method.

8. Determination of wavelength of a monochromatic light source by using Newton's rings experiment.
9. Determination of wavelength of a given laser source of light by using diffraction grating in normal incidence method.
10. Studying the characteristics and calculating the forward resistance of a LED.
11. Study of series and parallel resonance of an LCR circuit
12. Determination of time constant of an RC-circuit

NOTE: Any **TEN** of the above experiments are to be conducted.

Course Outcomes

After completing the experiment, students will be able to

- Understand and search to apply the fundamentals of magnetic induction, Ampere's law, Oersted's law and the Biot-Savart law.
- Analyze the concept and application parts of radius of gyration and periodic vibrations.
- Summarize the fundamentals of modulus-types, stress, strain, elasticity, plasticity and Hook's law.
- Understand the concept of radiation, ionizing radiation, radiological protection and inverse square law.
- Demonstrate the resonance phenomenon and verify the transverse laws of stretched strings by using Sonometer.
- Describe the types of waves like longitudinal, transverse, stationary and progressive waves. Electromagnetic induction and its applications.
- Know about the light properties-dispersion, prism, spectrometer and minimum deviation arrangement.
- Understand the concepts of interference, conditions, formation of Newton's rings-reason.
- Recognize the difference between the interference and diffraction, grating, laser characteristics.
- Analyze the difference between normal diode, LED, forward bias, reverse bias, I-V characteristics, direct and indirect band gap semiconductors.
- Analyze the LCR circuit combination, parallel, series electrical resonance, inductance, reactance, capacitance and electrical and electronic fundamentals.
- Characterize the RC network, time constant, capacitor functioning and its application.

ENGLISH (Oral Communication Skills) Lab

Course code: 7HC62

Branches: ECE, EEE and Mech (Sem-I) **L T P Credits**

ECM, CSE, IT and Civil (Sem-II) **0 0 2 1**

1	2	3	4	5	6	7	8	9	10	11	12
							X	X	X		X

Course Objectives: The course will develop the students' ability to

- integrate listening and speaking skills
- communicate effectively
- speak effectively on a given topic
- master the art of presentation
- interact with peers in a group discussion

Unit-I : Practice sessions on
Listening for General Information
Listen for specific information
Listening Comprehension

Unit-II: Practice sessions on
Types of Sentences
Question Tags

Unit-III: Practice sessions on
Self introduction, introducing others and greetings
Asking for and Giving Directions
Role Plays & Situational Dialogues

Unit-IV: Practice sessions on
JAM/Extempore/ Impromptu
Prepared talk on given topics

Unit-V : Practice sessions on
Formal Presentation
Information Transfer

Unit-VI: Practice sessions on
Group Discussion

Course Outcomes: After completing the course students will be able to

- understand, analyze and respond to the audience by listening effectively
- acquire the articulation of different types of sentences by practicing pause patterns and question tags.
- translate and demonstrate self, participate effectively in activities like JAM, extempore
- express and deliver a presentation on the given topic through role plays and situational dialogues
- implement English language to meet the standards of corporate and real world in a group.

1	2	3	4	5	6	7	8	9	10	11	12
								x	x		x

Syllabus for B. Tech I Year II Semester
TECHNICAL SEMINAR –II

Code: 7K291

L	T	P	C
-	-	2	1

Course Objective :
Develop ability to be a public speaker with the aid of Power Point Presentations. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts. Practice and develop communication skills and interview performance skills.

Course Outcomes:

4. Demonstrate public speaking with the aid of Power Point Presentations
5. Identify current general and specific technological topics of interest and prepare and present the content cogently.
6. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to the end of 9th week	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

1	2	3	4	5	6	7	8	9	10	11	12
X		X									

ELEMENTS OF MECHANICAL ENGINEERING

(Common to All Branches Except Mechanical Engineering)

Code : 7BC04

L	T	P/D	C
2	-	--	**2**

Course Objectives:

The main objective of the course is to offer the students fundamental knowledge of First Law of Thermodynamics*. Working of SI and CI engines, working principle of different types of Turbines&pumps.*

properties of material and engineering application. Working principles of various types of power transmission systems

COURSE OUTCOMES:

At the end of basic mechanical engineering a student should be able to

1. To acquire the knowledge of basic concepts of thermodynamics and analyze the p-v & t-s diagrams of the different cycles.
2. To acquire the knowledge two and four stroke engines,the function of components used in the steam power plant
3. To identify & understand the function of components used in VCR & VAR system, & about the working of hydraulic pumps & hydraulic turbines.
4. To identify & understand *properties of material and engineering application*
5. To acquire the knowledge *of various types of power transmission systems*
6. To acquire the knowledge the different NC and CNC machine.

UNIT - I

Energy Resources and Conversion, Basic concepts of Thermodynamics – general classification of heat engines, Property and state, System, Boundary and surroundings , Zeroth Law, First Law of Thermodynamics and its applications-Joule's experiment, reversible non-flow processes-Constant volume, constant pressure, constant temperature process, polytropic process, Second Law of Thermodynamics – Statements, Heat engines, Carnot cycle, Air standard cycles – Otto, Diesel Cycles.

UNIT-II

Internal combustion engines: Internal combustion engines, definition, classification, components, working of four stroke cycle engines, SI and CI Engines, Performance parameters, Need for cooling, and lubrication of IC engines.

Steam Power plant, Boiler, Steam Turbines: Layout of steam power plant, Water tube and Fire tube Boilers :- Simple cross-tube boiler, Cochran, Babcock and Wilcox Boiler and High Pressure Boilers. (Benson & La-mount only).

UNIT- III

a) **Hydraulic pumps & turbines:-** Centrifugal Pumps, Pelton wheel, Francis turbine and Kaplan Turbine -- Layout of Hydro electric power plant
b) **Refrigeration & Air conditioning systems:-** Description of Vapour Compression and Vapour Absorption systems

UNIT-IV

Engineering Materials – Classification, mechanical properties, Ferrous Materials – Constituents of Cast Iron & types of Cast Iron, Steels – manufacture by Bessemer converter, Arc furnace, types of steel, effect of alloying elements on steel, Stainless steel, Non- Ferrous Materials: Properties and applications of Aluminum & alloys, Copper and alloys, composite materials – types, fabrication methods, Ceramics – Properties and applications

.

UNIT-V

Transmission of Motion and Power – Shafting, Belt drive, types of belt drive, types of belts, chain drives, types of chain drive, Pulleys, parts, types of pulleys, gear drive- classification, Terminology of spur gear, Gear trains – simple and compound, Clutches – purpose and basic principle of contact clutch, brakes - purpose and basic principle of block brake

UNIT-VI

Robot and sensors – Introduction, definition, Robot component, **CNC Machine tools** – Introduction, Machine control, Vertical and Horizontal spindles, CNC drill, mill, boring and tapping, Adaptive control, NC and CNC turning centers

TEXT BOOKS :

Mathur, M.L., Mehta, F.S. and Tiwari, R.P., Elements of Mechanical Engineering, Jain Brothers, New Delhi, 2005.
R.K. Rajput, “Elements of Mechanical Engineering”, Laxmi Publications, 1994.

a	b	c	d	e	f	g	h	i	j	k	l
X	X	X								X	

II Year B. Tech, Semester-I

Engineering Mathematics–III
(Partial differential equations, Probability and Statistics)

		L	T	P/D	C
Code: 7HC12	**(Common to ME & CE)**	**3**	**1**	**0**	**3**

Pre Requisites: Engineering Mathematics-II

Course Objectives: *To make the students to understand and expected to learn*

1. *Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations.*
2. *Applications of PDE.*
3. *Concepts of the probability, types of random variables and probability distributions.*
4. *Sampling distributions and their properties, concepts on estimation.*
5. *Concepts on testing the hypothesis concerning to large samples.*
6. *Different kinds of tests related to small samples and tests concerned to small size samples and goodness of fit and independence of attributes using chi-square distribution.*

Syllabus

UNIT– I: First Order Partial Differential Equations: (10L)
Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions. Solutions to First order Linear and Non-linear Equations-Standard Forms, Equations Reducible to Standard Forms.

UNIT-II: Higher Order Partial Differential Equations: (10L)
Classification of partial differential equations. Method of Separation of Variables. Initial and Boundary conditions, Solutions of One dimensional wave, Heat equations and Laplacian equation in Cartesian form.

UNIT-III: Random Variables and Probability Distributions: (12L)
Conditional probability, Multiplication theorem, Baye's theorem (without Proof). Random variables – Discrete and Continuous, Probability Mass and Density Functions, Expectation and Variance. Probability Distributions: Binomial, Poisson and Normal Distributions.

UNIT-IV: Sampling Distributions and Estimation: (8L)

Populations and Samples, Sampling distribution of the Mean (σ - known and Unknown), Sums and Differences, Central limit theorem.Estimation: Point Estimation and Interval Estimation concerning Means for Large Samples.

UNIT-V: Tests of Hypothesis for Large Samples: (10 L)
Tests of Hypothesis, Type–I and Type-II Errors, Hypothesis testing concerning one mean and two means and Test of Hypothesis concerning one Proportion and difference of proportions.

UNIT-VI: **Tests of Hypothesis for Small Samples**: **(10 L)**
Student t-test, Hypothesis testing concerning one mean and two means, F-test and χ^2 test-Goodness of fit, Independence of Attributes.

TEXT BOOKS:

1. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications, New Delhi.
2. Ronald E. Walpole,Raymond H. Myers,Sharon L. Myers,Keying Ye, Probability & Statistics For Engineers & Scientists, 9th Ed. Pearson Publishers.
3. Probability and Statistics for Engineers: Miller and John E. Freund, PHI Publishers, 9th Edition

REFERENCE BOOKS:

1. Advanced Engineering Mathematics, S.R.K. Iyengar and R.K.Jain, Narosa Publication.
2. Probability and Statistics, T.K.V. Iyengar, B. Krishna Gandhi, S. Ranganatham, M.V.S.S.N. Prasad, S. Chand Publications.
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, pearson Educations.
4. Ramana B.V., Higher Engineering Mathematics, Tata McGraw Hill New Delhi, 11th Reprint, 2010.

Course Outcomes:
Students will able to

1. *Form partial differential equations and find the solution to first order linear and nonlinear partial differential equations.*
2. *Applications of PDE.*
3. *Learn basic concepts of probability and able to evaluate probability.*
4. *Will able to solve problems on discrete and continuous probability distributions.*
5. *Learn basic concepts of sampling distribution and able solve problems on estimation.*
6. *Learn basic concepts of test of hypothesis and able solve problems.*

1	2	3	4	5	6	7	8	9	10	11	12
X	X		X								

7K301: Introduction to Solid Mechanics

B.Tech II Year I Sem.

L	T	P/D	C
3	1	-	3

Course Objectives:

1. To understand the basic concept of the stress and strain for different materials.
2. To know the mechanism of the development of shear force and bending moments in beams.
3. To analyze and understand flexural stress, direct and bending stresses.
4. To study deflection of beams, in different types of loadings and support conditions.
5. To understand the basic concepts of Principal Stresses and Strains
6. To study about Shear Stresses and Theories of Failure

Course Outcomes:

At the end of the course the student should have learnt,

1. To evaluate the strength of concept of the stress and strain for different materials
2. To evaluate the behavior of different beams for Shear Force and Bending Moment diagrams
3. To evaluate the behavior and strength of flexural stress, direct and bending stresses
4. To evaluate the deflection of beams subjected to various loads.
5. To determine the Principal Stresses and Strains in the members subjected to stresses
6. To evaluate the Shear Stresses and Theories of Failure.

UNIT – I

Simple Stresses and Strains: Elasticity and plasticity – Types of stresses and strains – Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses. Elastic constants.

UNIT – II

Shear Force and Bending Moment: Definition of beam – Types of beams – Concept of shear force and bending moment – S.F and B.M diagrams for cantilever, simply supported and overhanging beams subjected to point loads, uniformly distributed load, uniformly varying loads and combination of these loads – Point of contra flexure – Relation between S.F., B.M and rate of loading at a section of a beam.

UNIT – III

Flexural Stresses: Theory of simple bending – Assumptions – Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination of bending stresses – Section modulus of

rectangular and circular sections (Solid and Hollow), I,T, Angle and Channel sections – Design of simple beam sections.

Direct and Bending Stresses: Stresses under the combined action of direct loading and bending moment, core of a section**.**

UNIT – IV

Deflection of Beams:

Bending into a circular arc – slope, deflection and radius of curvature – Differential equation for the elastic line of a beam – Double integration and Macaulay's methods – Determination of slope and deflection for cantilever and simply supported beams subjected to point loads, U.D.L, Uniformly varying load-Mohr's theorems – Moment area method – application to simple cases including overhanging beams.

UNIT – V

Principal Stresses and Strains : Introduction – Stresses on an inclined section of a bar under axial loading – compound stresses – Normal and tangential stresses on an inclined plane for biaxial stresses – Two perpendicular normal stresses accompanied by a state of simple shear– Mohr's circle of stresses – Principal stresses and strains – Analytical and graphical solutions.

UNIT – VI

Shear Stresses: Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T angle sections.

Theories of Failure: Introduction – Various theories of failure - Maximum Principal Stress Theory, Maximum Principal Strain Theory, Maximum shear stress theory- Strain Energy and Shear Strain Energy Theory (Von Mises Theory).

TEXT BOOKS:

1. Strength of Materials by Subramanian, Third Edition 2016, Oxford University Press, ISBN:0-19-946473-
2. Strength of materials by B.C. PUNMIA, Laxmi publishers TENTH EDITION JUNE 2013, ISBN 978-81-318-0925-9. [15 copies]

REFERENCES:

1. Mechanics of materials by Egor P Popov, Second Edition, Pearson, ISBN 978-93-325-5954
2. Strength of Materials by W.A Nash, MC Graw Hills 2014 6th edition.
3. Mechanics of Materials by James M Gere and Barry J Goodno Cengage Learning India Pvt. Ltd Eight edition.
4. Mechanics of Structures Vol –I by H. J. Shah and S. B. Junnarkar, Charotar Publishing House Pvt. Ltd.
5. Strength of Materials by S. S. Rattan, McGraw Hill Education Pvt. Ltd.
6. Fundamentals of Solid Mechanics by M. L. Gambhir, PHI Learning Pvt. Ltd.

1	2	3	4	5	6	7	8	9	10	11	12
x	x			x							

7K302: SURVEYING AND GEOMATICS

B.Tech II Year I Sem.

L	T	P/D	C
3	1	---	3

Course objectives:

The student is being exposed to the subject with following Objectives:

1. Study the basic concepts and principles of surveying
2. Know the importance of compass, levelling survey and its practical applications
3. To understand the concept of Trigonometric levelling and applying the same for finding the elevations of object by various methods
4. To understand the importance of various curves and the methods of setting them.
5. Get acquainted with the principles and methods of Remote sensing and GIS/GPS surveying
6. Understand the theory of Aerial mapping

Course outcomes:

After studying this course, the students will be able to:

1. Calculate angles, distances using chain and tape
2. Identify data collection methods using a compass and enhance knowledge of the various field applications of levelling
3. Apply the concepts of Trigonometric levelling
4. Set out curves on the field and overcome obstructions in curve ranging
5. To apply the concepts of Remote sensing and GIS/GPS to Civil Engineering problems
6. Read Aerial maps and perform necessary calculations

UNIT – I

Introduction to Surveying, principles, linear, angular and graphical methods, Survey stations, Survey lines - Ranging, Calculation of Areas - Mid Ordinate, Average Ordinate, Trapezoidal and Simpsons methods

Applications: To calculate areas by measuring distances of ground features using various accessories

UNIT – II

Compass Surveying - Bearing of survey lines, Local Attraction, Declination, Dip

Leveling - Principles of leveling - Booking and reducing levels; Types of leveling, Digital and Auto Level, Errors in leveling

Contouring - Characteristics, methods, uses, areas and volumes

Applications: To measure distances and inclinations between different physical features on the ground.

UNIT – III

Theodolite survey - Instruments, Measurement of horizontal and vertical angle; Horizontal and vertical control - methods - Intervisibility of height and distances - Trigonometric leveling (Single and Double plane)

Triangulation - Network - Signals and Towers. Baseline - choices - instruments and accessories - extension of base lines - corrections - Satellite station - reduction to centre
Traversing - Methods of traversing, traverse computations and adjustments, Gale's traverse table, Omitted measurements
Applications: To estimate topographic and elevation details necessary for major construction sites such as highways, bridges, tunnels, and dams.

UNIT – IV
Tacheometric Surveying - Principle of Tacheometry, Distance measurement for horizontal Line of Sight
Curves - Types of curves and their necessity, Horizontal Curves - Elements of simple and compound curves - Method of setting them
Modern Field Survey Systems - Principle of Electronic Distance Measurement, Modulation, Types of EDM instruments - Total Station - Parts of a Total Station - Accessories - Advantages and Applications, Field Procedure for total station survey, Errors in Total Station Survey
Applications: Used for planning and design of transportation systems such as highways and railways.

UNIT – V
Global Positioning Systems - Segments, GPS measurements, errors and biases, Surveying with GPS, Co-ordinate transformation, accuracy considerations
Remote Sensing - Introduction - Electromagnetic Spectrum, interaction of electromagnetic radiation with the atmosphere and earth surface, remote sensing data acquisition - platforms and sensors; visual image interpretation; Introduction to digital image processing
Applications: To precisely mark the boundaries of properties such as in Cadastral Surveying

UNIT – VI
Photogrammetric Surveying - Introduction, Basic concepts, perspective geometry of aerial photograph, relief and tilt displacements, terrestrial photogrammetry, flight planning; Stereoscopy, ground control extension for photographic mapping- aerial triangulation, radial triangulation, methods
Applications: To mark the national and state boundaries, chart coastlines, navigable streams and lakes

TEXT BOOKS:

1. Surveying and Leveling by R. Subramanian, Second Edition Oxford University Press - 2012
2. Anji Reddy, M., Remote sensing and Geographical information system, B.S. Publications, 2001.

REFERENCES:

1. Surveying Theory and Practice Seventh edition by James M. and Anderson Edward M. Mikhail TATA McGraw Hill
2. Duggal S K, "Surveying (Vol – 1 & 2), Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2004.
3. Arthur R Benton and Philip J Taety, Elements of Plane Surveying, McGraw Hill – 2000
4. "Advanced Surveying Total Station GIS and Remote Sensing by Satheesh Gopi, R. Sathi Kumar and N. Madhu.

1	2	3	4	5	6	7	8	9	10	11	12
						x				x	x

7K303: BUILDING MATERIALS AND PLANNING

B.Tech II Year I Sem.

L	T	P/D	C
3	-	-	2

Course Objectives:

To introduce the students to,

1. To study about the basic building materials, properties and their applications.
2. The manufacturing process of cement, its basic composition and its testing specifications.
3. The types of masonry, mortars and finishes provided in a building.
4. The types of timber, paints and the emerging building materials.
5. To understand the different types of arches, roofs and floors.
6. The principles of planning and construction bye-laws.

Course Outcomes:

At the end of the course, the student will be able to,

1. Identify the different materials and use them appropriately.
2. Test the various properties of cement and to use the appropriate admixtures.
3. Identify the various mortars and check for its suitability in various jobs.
4. To effectively use new building materials and appropriate paints for the various works undertaken.
5. Appropriately suggest the different roof and floor types for different construction practices.
6. Plan construction activities in adherence with the bye-laws.

UNIT- I:

Stones: Uses of stones as building materials. Characteristics of good building stones. Classification of stones. Quarrying -Various methods. Dressing and polishing of stones.

Bricks: Composition of brick clay. Methods of manufacturing bricks. Preparation of brick earth, Tempering, Pugmill. Various steps of moulding. Drying and method of burning of bricks-clamps. Intermittent and continuous kilns. Bull's trench kiln, Holfman's kiln. Characteristics of good building bricks. Classification of bricks

Building Blocks: Hollow building blocks for walls and roofing. Load bearing and non-load bearing blocks. Provisions of IS2572.Fly ash bricks and their manufacture.

UNIT- II:

Cement: Chemical composition of the ingredients for manufacturing cement. Outline of manufacturing process, flow diagram. Tests of cement.I.S.269 specifications for Ordinary Portland Cement.Various types of cements.

Blended Cements: Various types and their uses.

Fine aggregates: Characteristics of good mortar sand, availability of sand and its classifications. Alternatives to natural sand. Bulking of sand.

Coarse Aggregates: Characteristics of good coarse aggregates for manufacture of concrete. Tests on aggregate. Light weight aggregates.

UNIT - III

Mortar: Different types of mortars, preparation, setting and curing. Manufacturing methods of mortar.

Concrete: Batching, mixing, transporting, compacting and curing. Ready mix concrete.

Reinforced steel: Types of reinforcement, specifications, storage and handling.

Plastering, pointing and white/colour washing: Types of Plastering, preparation of surfaces and defects. Types of pointing, preparation of surfaces.

Forms work and scaffolding: Requirements, types, materials, accessories, reuses and maintenance.

UNIT - IV

Timber: Timber as a building material and its uses. Various types of timber. Seasoning and its importance. Preservation of wood. Laminates and their uses.

Paints, Varnish and Distemper: Constituents, characteristics of good paints. Bases, vehicles, thinners and colouring pigments. Painting of different types of surfaces; types of varnish, and application. Types of distemper and application.

Emerging Building Materials: Energy conservation in buildings. Recycled materials, local materials and industrial waste products as a means of sustainable development, Glass, FRPs, composites and smart materials, Aluminum composite paneling, Structural

Glazing , UPVC door frames.

UNIT - V

Lintels and Arches:

Definition, function and classification of lintels, balconies, chejja and canopy, Arches; Elements and Stability of an Arch.

Floors and roofs:

Floors: Requirements of good floor, Components of ground floor, Selection of flooring material, Laying of Concrete, Mosaic, Marble, Granite, Tile flooring, Cladding of tiles.

Roof: Requirement of good roof, Types of roof, Elements of a pitched roof, trussed roof, King post Truss, Queen Post Truss, Steel Truss, Different roofing materials, R.C.C.Roof.

UNIT - VI

Building Planning: Principles of Building Planning; General Building regulations and Bye laws for Residential Buildings; Climate and its influence on planning- Elements of climate: Solar radiation, Wind, Relative Humidity, Temperature, precipitation, topography.

TEXT BOOKS:

1. Building Construction by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) Ltd., New Delhi.
2. Building Materials and Construction – Arora & Bindra, Dhanpat Roy Publications.

REFERENCE BOOKS:

1. Building Materials and Construction by G C Sahu, Joygopal Jena McGraw hill Pvt Ltd 2015.
2. Building Materials by Duggal, New Age International.
3. Building Materials by P. C. Varghese, PHI.
4. Building Construction by PC Varghese PHI.
5. Construction Technology – Vol – I & II by R. Chubby, Longman UK.

1	2	3	4	5	6	7	8	9	10	11	12
								x		x	

7ZC01: MANAGEMENT SCIENCE AND FINANCIAL ACCOUNTING (MSFA)

L	T	P	Cr
2	0	0	2

Course Objective: To make students understand the basics of management and Financial Accounting, its principles, practices and latest concepts for increasing the performance of engineering graduates in their respective fields, which facilitate them in making better planning and decisions

Course Outcomes:

1. Outlines the significance of management, defines the basic concepts and applicability of management principles in changing paradigms.
2. Helps in understanding organization behavior, personality determinants and other key aspects
3. Infers the need to understand the importance of Strategic management and Business environment in particular
4. Enrich students with basic concepts of Financial Accounting.
5. Understand basic concepts of Depreciation and need for preparing trial balance.
6. Helps in preparation of Financial Statements (final accounts).

UNIT I

INTRODUCTION TO MANAGEMENT: Management- Definitions, Levels of Management, Functions of management- Planning: types of planning, planning process; Organizing: Organizational Design and Structure, Staffing; Directing; Controlling: Basic control process- Fayol's principles of Management - Taylor's principles of scientific management- Maslow's Motivational theory.

UNIT II

INTRODUCTION TO ORGANIZATIONAL BEHAVIOR: Definition, Nature and Scope of OB, Personality-determinants of Personality – Perception- Attitudes- Attribution theory- Johari Window and Transactional Analysis, Stress Management- factors and remedies

UNIT III

STRATEGIC MANAGEMENT: Introduction to Strategic Management, Vision, Mission, Goals, Objectives, Environmental Scanning- PESTEL, SWOT Analysis, Competitive Advantage, Concept of Core Competence, PORTER's five force model, types of strategies, Strategic formulation and Implementation.

UNIT IV

FUNDAMENTALS OF FINANCIAL ACCOUNTING: Definition of Accounting, Accounting Concepts and conventions, principles of Double-Entry system, Book Keeping, Overview of books of original records Journal, Ledger and Subsidiary books

UNIT V

TRIAL BALANCE AND DEPRECIATION OF FIXED ASSETS: Significance of Trial balance, Preparation of trial balance Definition of Depreciation, Depreciation of fixed assets, Methods of Depreciation – Straight line method and Diminishing Balance method

UNIT VI

CLASSIFICATION OF REVENUE AND CAPITAL EXPENSES, AND PREPARATION OF FINAL ACCOUNTS: Revenue expenditure, Capital expenditure, Preparation of Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments

References:

- A R Aryasri: Management Science, Tata Mc Graw Hill
- Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi
- A R Aryasri: Managerial Economics and Financial Analysis, Tata Mc Graw Hill

1	2	3	4	5	6	7	8	9	10	11	12
	x	x									x

7K371: MECHANICS OF SOLIDS LABORATORY

B.Tech II Year I Sem.

L	T	P/D	C
-	-	3	1.5

Course Objectives:
The objective of the course is to make the student understand the behavior of materials under different types of loading for different types structures

Course Outcomes: At the end of the course, the student will be able to:
1. Conduct tension test on Materials like steel etc.
2. Conduct compression tests on spring, wood and concrete
3. Conduct flexural and torsion test to determine elastic constants
4. Determine hardness of metals

List of Experiments:
1. Tension test
2. Bending test on (Steel / Wood) Cantilever beam.
3. Bending test on simple support beam.
4. Torsion test
5. Hardness test
6. Spring test
7. Compression test on wood or concrete
8. Impact test
9. Shear test
10. Verification of Maxwell's Reciprocal theorem on beams.
11. Use of electrical resistance strain gauges
12. Continuous beam – deflection test.

List of Major Equipment:
1. UTM for conducting tension test on rods
2. Steel beam for flexure test
3. Wooden beam for flexure test
4. Torsion testing machine
5. Brinnell's / Rock well's hardness testing machine
6. Spring testing machine
7. Compression testing machine
8. Izod Impact machine
9. Shear testing machine
10. Beam setup for Maxwell's theorem verification.
11. Continuous beam setup
12. Electrical Resistance gauges.

1	2	3	4	5	6	7	8	9	10	11	12
	x		x								x

7K372: SURVEYING LABORATORY

B.Tech II Year I Sem.

L	T	P/D	C
-	-	3	1.5

Course Objectives:

The student is being exposed to the course with the following purpose.

1. Gain hands on experience with the working principles of various instruments such as Total Station.
2. Be able to set out any Civil Engineering work in the field.
3. Learn about the various automation processes being used in surveying works

Course Outcomes:

At the end of the course, the student is expected to have learnt the following.

1. Stake out/Lay out different types of curves in the field.
2. Use modern instruments such as Total Station and GPS for locating and plotting any/all ground features.
3. Develop contour maps for vast swathes of lands at ease and with minimum supervision

List of Experiments

1. To determine the distance between two points using Direct Ranging
2. Calculate the area of a given piece of land/tract using compass surveying (Traversing or Radiation method)
3. To determine the Reduced Levels of different points using principle of leveling
4. Introduction to Theodolite / Using a Theodolite, Measuring the Horizontal angle between two given points using Repetition method
5. Using a Theodolite, Measuring the Horizontal angle between given points using Reiteration method and calculating the area of given tract of land
6. Plotting a Simple Curve using Angular Method – Rankines Method
7. Introduction to Total Station / Determination of area of a given tract of land using Total Station
8. Contouring using Total Station
9. Determining the Remote Height using Total Station
10. Setting out a Curve Setting using Total Station
11. Calculating the Distance, gradient, differential height between two inaccessible points using Total Station
12. With the help of Total Station, Stake out / Setting layouts for Buildings, Pipelines, etc

Miscellaneous Experiments (Demonstration Only)

1. Plotting a Simple Curve using Linear Method – Offsets from Long Chord
2. Resection using Total Station
3. Traversing using Total Station
4. Introduction to GPS – locating ground Features

Textbooks

1. Surveying and Levelling by NN Basak, McGraw Hill – 2014
2. Laboratory Manual

1	2	3	4	5	6	7	8	9	10	11	12
				x				x			x

7K373: COMPUTER AIDED DRAFTING OF BUILDINGS LABORATORY

B.Tech II Year I Sem.

L	T	P/D	C
-	-	3	1.5

Course Objectives:

The objective of this lab is to teach the student basic drawing fundamentals in various civil engineering applications, especially in building drawing, 3d modeling of building, interior designing etc using Auto CAD, Sketch up and 3ds Max.

Course Outcomes:

At the end of the course, the student will be able to:

1. Master the usage of AutoCAD commands for drawing 2D & 3D building drawings;
2. Get basic knowledge on Sketch up and 3ds Max for architectural work required for different civil engineering applications.

List of Experiments

1. Introduction to computer aided drafting.
2. Practice exercises on CAD software.
3. Theoretical study on buildings and Drawing Plans of
    a) Single storied buildings b) Multi storied buildings
4. Developing sections and elevations for
    a) Single storied buildings b) Multi storied buildings
5. Detailing of building components like Doors, Windows, Roof Trusses etc., using CAD software.
6. Exercises on development of working drawings of buildings.
7. Introduction to Sketch up.
8. Preparing working model of simple single story, multi storey and duplex house etc. using Sketch up.
9. Introduction to 3ds Max.
10. Preparing working model of simple single storey, multi storey and duplex house etc. using 3ds Max

TEXT BOOKS:

1. Computer Aided Design Laboratory by M. N. Sesha Praksh & Dr. G. S. Servesh – Laxmi Publications.
2. Engineering Graphics by P. J. Sha – S. Chand & Co.

1	2	3	4	5	6	7	8	9	10	11	12
								X	X		X

Syllabus for B. Tech II Year I Semester
Civil Engineering
TECHNICAL SEMINAR –III

Code: 7K391

L	T	P	C
-	-	2	1

Course Objective :
Develop ability to be a public speaker with the aid of Power Point Presentations. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Literature survey, topic and Content	: 10 marks
Presentation including PPT	: 15 marks
Seminar Notes	: 10 marks
Interaction	: 5 marks
Report	: 10 marks
Attendance in the seminar class	: 10 marks
Punctuality in giving seminar as per schedule time and date	: 10 marks
Mid semester viva (on the seminar topics completed up to the end of 9th week	: 10 marks
End semester Viva	: 20 marks
Total	100 marks

1	2	3	4	5	6	7	8	9	10	11	12
x	x										x

7AC48: ELECTRICAL & ELECTRONICS ENGINEERING

L	T	P/D	C
2	---	---	2

Course Outcomes:

CO's: after studying this course, the student will be able to

1. Understand the fundamentals of electrical engineering and DC machines.
2. Understand the principles of AC circuits.
3. Understand the principle and operation of three phase induction motor and measuring instruments.
4. Understand the principle and operation of diode.
5. Understand the principle and operation of transistor.
6. Understand the principles of digital electronics.

Unit – I: Fundamentals of Electrical Engineering and DC Machines:
Ohm's Law, Kirchhoff's Laws, types of sources, passive elements. Series parallel circuits, mesh and nodal analysis. Superposition, Reciprocity theorem.
DC Machines: Principle of operation of D.C generators, types, E.M.F equation. Principle of operation of D.C motors, Types motors, Torque equation, Losses and efficiency, simple problems on D.C Generators and motors.

Unit – II: Fundamentals of AC circuits:
AC voltage wave form and basic definitions: Peak Value, R.M.S. value, Average values, Form factor and Peak factor, 'j' operator, Analysis of single phase AC circuits series and parallel (Simple circuits). Three phase circuits – Star - delta connection, Relation between line and phase voltages / currents in a 3-phase Star-Delta balanced system.

Unit – III: Induction Motors and Instruments:
Concept of Faraday's laws, 3- phase induction motor working principle, operation and construction details.
Instruments: Introduction, classification of instruments, operating principles, essential features of measuring instruments, permanent magnet moving coil (PMMC) instruments, moving iron (MI) instruments.

UNIT IV-DIODE: Overview of Semiconductors, PN junction diode and Zener diode –Diode circuits: rectifiers (bridge type only), filters, clippers and clampers.

UNIT V- TRANSISTOR: BJT construction, operation, characteristics (CB, CE and CC configurations) and uses – JFET and MOSFET construction, operation, characteristics (CS configuration) and uses.

UNIT VI-DIGITAL ELECTRONICS :Number systems – binary codes –binary arithmetic - Boolean algebra, laws & theorems - simplification of Boolean expression using K maps - logic gates - implementation of Boolean expressions using logic gates - standard forms of Boolean expression.

Text Books:

1. Basic Electrical Engineering –T.K. Nagesarkar and M.S. Sukhja, Oxford University Press.2nd edition.
2. Basic electrical Engineering – M.S. Naidu and S. Kamakshiah – TataMcGraw-Hill, 2005 edition.
3. Basic Electrical & Electronics Engineering –T.K. Nagesarkar and M.S. Sukhja, Oxford University Press.2nd edition.
4. Principles of Electronics - V.K.Mehta, S.Chand Publications, 2nd edition.

References:

1. Theory and problems of Basic electrical Engineering- D.P.Kotahari & I.J.Nagrath PHI.
Electronic Devices and Circuits, Millman & Halkias, TMH publications.

1	2	3	4	5	6	7	8	9	10	11	12
x	x		x								

7K404: Mechanics of Materials

B.Tech II Year II Sem. **L T P C**
3 1 0 3

Course Objectives:

- Understand the deformation and strains under different load action and response in terms of forces and moments.
- Understand the behavior under different loading actions.
- Comprehend the deformation of structures under load actions.
- Understand the force-stress equilibrium relationship in Multiaxial load condition.
- Understand the displacement-strain relationship in Multiaxial load condition.
- Understand the stress behavior in the thin cylinders and sphere.

Course Outcomes:

- Able to evaluate the deformation of structures.
- Describe the stability of structures under certain loading conditions.
- To assess the deformation for structures under load actions.
- To evaluate the force-stress equilibrium relationship in Multiaxial load condition.
- To evaluate the displacement-strain relationship in Multiaxial load condition.
- To solve the stress behavior pattern in thin cylinder and sphere.

UNIT I:
Deformation and Strain covering description of finite deformation, Infinitesimal deformation; Analysis of statically determinate trusses; Stress analysis of thin, thick and compound cylinder;

UNIT II:
Generalized state of stress and strain: Stress and strain tensor, Yield criteria and theories of failure; Tresca, Von-Mises, Hill criteria, Heigh-Westerguard's stress space.

UNIT III:
Momentum Balance and Stresses covering Forces and Moments Transmitted by Slender Members, Shear Force and Bending Moment Diagrams, Momentum Balance, Stress States / Failure Criterion.

UNIT IV:
Mechanics of Deformable Bodies covering Force-deformation Relationships and Static Indeterminacy, Uniaxial Loading and Material Properties, Trusses and Their Deformations, Statically Determinate and Indeterminate Trusses.

UNIT V:

Bending: Stress and Strains; Deflections and Torsion covering Pure Bending, Moment-curvature Relationship, Beam Deflection, Symmetry, Superposition, and Statically Indeterminate Beams, Shear and Torsion, Torsion and Twisting, General energy theorems, Castigliano's theorem, Maxwell Bettie's reciprocal theorem; Virtual work and unit load method for deflection, Application to problems of beams and frames.

UNIT VI:

Structural stability; Stability of columns, Euler's formula, end conditions and effective length factor, Columns with eccentric and lateral load; Plasticity and Yield Design covering 1D-Plasticity – An Energy Approach, Plasticity Models, Limit Analysis and Yield Design

Text Books:

1. Timoshenko, S. and Young, D. H., "Elements of Strength of Materials", DVNC, New York, USA.
2. Hibbeler, R. C. Mechanics of Materials. 6th ed. East Rutherford, NJ: Pearson Prentice Hall, 2004

Reference Books:

1. Crandall, S. H., N. C. Dahl, and T. J. Lardner. An Introduction to the Mechanics of Solids. 2nd ed. New York, NY: McGraw Hill, 1979

1	2	3	4	5	6	7	8	9	10	11	12
x	x		x								

7K405: Fluid Mechanics

B.Tech II Year II Sem.

L	T	P/D	C
3	1	-	3

Course Objectives:

1. Understand fluid properties of Newtonian fluids.
2. Study analytical solutions to a variety of simplified problems.
3. Understand the dynamics of fluid flows and the governing equations.
4. Apply concepts of mass, momentum and energy conservation to flows.
5. Grasp the basic ideas of turbulence and energy loss in fluid flows.
6. Study the influence of boundaries of a body under fluid flow.

Course Outcomes:

1. Apply conservation laws to derive governing equations of fluid flows.
2. Compute hydrostatic and hydrodynamic forces.
3. Analyze and design simple pipe systems.
4. Apply principles of dimensional analysis to design experiments.
5. Compute drag and lift coefficients.
6. Applying boundary influences on a body moving within fluid

UNIT-I:

Fluid Properties: Basic Concepts and Definitions – Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitation; surface tension, capillarity, Bulk modulus of elasticity, compressibility.

UNIT-II:

Fluid Statics - Fluid Pressure: Pressure at a point, Pascals law, hydrostatic law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micromanometers. pressure gauges, Hydrostatic force on submerged horizontal, vertical, and inclined surfaces. Buoyancy and stability of floating bodies.

UNIT – III:

Fluid Kinematics: Description of fluid flow, Stream line, path line and streak lines and stream tube. Classification of flows : Steady, unsteady, uniform, non uniform, laminar, turbulent, rotational and irrotational flows – Equation of continuity for one, two , three dimensional flows– stream and velocity potential functions, circulation and vortices, flow net analysis.

UNIT – IV:

Fluid Dynamics: Surface and body forces – Euler's and Bernoulli's equations for flow along a stream line for 3-D flow, Navier – Stokes equations (Explanatory), Momentum equation and its application – forces on pipe bend.

Pitot tube, Venturi meter, and orifice meter – classification of orifices, flow over rectangular, Triangular and trapezoidal and stepped notches - Broad crested weirs.

Dimensional Analysis and Dynamic Similitude - Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number; Buckingham's π-Theorem.(Added)

UNIT – V:

Closed Conduit Flow: Reynolds's experiment – Characteristics of Laminar & Turbulent flows. Laws of Fluid friction – Darcy's equation, variation of friction factor with Reynolds's number – Moody's Chart, Minor losses – pipes in series – pipes in parallel – Total energy line and hydraulic gradient line. Pipe network problems Flow between parallel plates, Flow through long tubes, flow through inclined tubes, water hammer (no derivations).

UNIT – VI:

Boundary Layer Theory: Approximate Solutions of Navier Stokes Equations – Boundary layer – concepts, Prandtl contribution, Characteristics of boundary layer along a thin flat plate, Von-karmen momentum integral equation, laminar and turbulent Boundary layers (no derivations) BL in transition, separation of BL, control of BL, flow around submerged objects-Drag and Lift- Magnus effect .

TEXT BOOKS:

1. Fluid Mechanics by RC Hibbeler, SI Units ISBN 978-93-325-4701-8, Pearson Publications.
2. Bansal. R. K, "Fluid Mechanics and Hydraulics Machines", 5th edition, Laxmi publications (P) Ltd., New Delhi, Ninth Edition, 2006.

REFERENCE BOOKS:

1. Fluid Mechanics and Machinery by CSP. Ojha, R Berndtsson, PN. Chandramouli, Oxford University Press.
2. Fluid Mechanics 8th Edition in SI units By Frank M White, McGraw-Hill, ISBN 978-93-85965-49-4.
3. Fluid Mechanics and Machinery By Mohd. Kaleem Khan, Oxford University Press, ISBN 978-0-19-945677-2.
4. Fluid Mechanics by Piyush Kundu.
5. Rajput.R.K, "A text book of Fluid Mechanics and Hydraulic Machines", S. Chand & Company Ltd., New Delhi, Fourth edition, 2010.

1	2	3	4	5	6	7	8	9	10	11	12
								x	x	x	

7K406: CONSTRCUTION ENGINEERING AND MANAGEMENT

B.Tech II Year II Sem.

L	T	P/D	C
3	1	-	3

Course Objectives:

1. Understand construction planning.
2. Study and understand different construction methods.
3. Understand and familiarize with various construction equipment.
4. Understand basics of construction planning.
5. Grasp the basic ideas of construction monitoring and control.
6. Study and grasp importance of contracts management.

Course Outcomes:

1. Apply construction planning to actual construction works;
2. Able to differentiate different construction methods and their suitability;
3. Understand conventional and mechanized construction methods.
4. Able to apply construction planning to construction projects;
5. Able to apply the knowledge of construction monitoring and control to construction projects;
6. Able to apply the knowledge of contracts management and cost management to construction projects;

Unit I

Basics of Construction- Unique features of construction, construction projects types and features, phases of a project, agencies involved and their methods of execution;

Construction project planning- Stages of project planning: pre-tender planning, pre-construction planning, detailed construction planning, role of client and contractor, level of detail. Process of development of plans and schedules, work break-down structure, activity lists, assessment of work content, concept of productivities, estimating durations, sequence of activities, activity utility data; Techniques of planning- Bar charts, Gantt Charts. Networks: basic terminology, types of precedence relationships, preparation of CPM networks: activity on link and activity on node representation, computation of float values, critical and semi critical paths, calendaring networks.PERT- Assumptions underlying PERT analysis, determining three time estimates, analysis, slack computations, calculation of probability of completion.

Unit II

Construction Methods basics: Types of foundations and construction methods; Basics of Formwork and Staging; Common building construction methods (conventional walls and slabs; conventional framed structure with block work walls; Modular construction methods for repetitive works; Precast concrete construction methods; Basics of Slip forming for tall structures; Basic construction methods for steel structures; Basics of construction methods for Bridges.

Unit III:

Construction Equipment basics*:* Conventional construction methods Vs Mechanized methods and advantages of latter; Equipment for Earthmoving, Dewatering; Concrete mixing, transporting & placing; Cranes, Hoists and other equipment for lifting; Equipment for transportation of materials. Equipment Productivities.

Unit IV:

Planning and organizing construction site and resources- Site: site layout including enabling structures, developing site organization, Documentation at site; Manpower: planning, organizing, staffing, motivation; Materials: concepts of planning, procurement and inventory control; Equipment: basic concepts of planning and organizing; Funds: cash flow, sources of funds; Histograms and S-Curves. Earned Value; Resource Scheduling- Bar chart, line of balance technique, resource constraints and conflicts; resource aggregation, allocation, smoothening and leveling. Common Good Practices in Construction

Unit V:

Project Monitoring & Control- Supervision, record keeping, periodic progress reports, periodical progress meetings. Updating of plans: purpose, frequency and methods of updating. Common causes of time and cost overruns and corrective measures. Basics of Modern Project management systems such as Lean Construction; Use of Building Information Modelling (BIM) in project management; Quality control: concept of quality, quality of constructed structure, use of manuals and checklists for quality control, role of inspection, basics of statistical quality control. Safety, Health and Environment on project sites: accidents; their causes, effects and preventive measures, costs of accidents, occupational health problems in construction, organizing for safety and health.

Unit VI:

Contracts Management basics*:* Importance of contracts; Types of Contracts, parties to a contract; Common contract clauses (Notice to proceed, rights and duties of various parties, notices to be given, Contract Duration and Price. Performance parameters; Delays, penalties and liquidated damages; Force Majeure, Suspension and Termination. Changes & variations, Dispute Resolution methods.
Construction Costs: Make-up of construction costs; Classification of costs, time cost trade-off in construction projects, compression and decompression.

Text/Reference Books:

1. Varghese, P.C., "*Building Construction"*, Prentice Hall India, 2007.
2. *National Building Code*, Bureau of Indian Standards, New Delhi, 2017.
3. Chudley, R., *Construction Technology*, ELBS Publishers, 2007.
4. Peurifoy, R.L. Construction Planning, Methods and Equipment, McGraw Hill, 2011
5. Nunnally, S.W. Construction Methods and Management, Prentice Hall, 2006
6. Jha, Kumar Neeraj., Construction Project management, Theory & Practice, Pearson Education India, 2015
7. Punmia, B.C., Khandelwal, K.K., Project Planning with PERT and CPM, Laxmi Publications, 2016.

7K407: Hydrology and Water Resources Engineering

B. Tech II Year II Sem.

L	T	P/D	C
3	-	-	2

1	2	3	4	5	6	7	8	9	10	11	12
X	X	X		X							

Course objectives:

To enable the students,

1. Get comprehensive knowledge about occurrence, quantification of precipitaion;
2. understand abstractions of precipitation;
3. understand runoff calculation
4. know about various water withdrawals and uses;
5. understand different water distribution systems;
6. study various types of dams and spillways.

Course outcomes:

At the End of the course the student will be able to,

1. quantify precipitation;
2. estimate various abstractions of precipitation;
3. estimate runoffs from given data;
4. grasp and apply the knowledge of various water withdrawals and uses to practical problems;
5. able to apply design basic water distribution systems;
6. able to arrive at hydrologic design of spillways.

Unit I: Introduction

Hydrologic cycle, water-budget equation, history of hydrology, world water balance, applications in engineering, sources of data. Precipitation - forms of precipitation, characteristics of precipitation in India, measurement of precipitation, rain gauge network, mean precipitation over an area, depth area-duration relationships, maximum intensity/depth-duration-frequency relationship, Probable Maximum Precipitation (PMP), rainfall data in India.

Unit II: Abstractions from precipitation

Evaporation process, evaporimeters, analytical methods of evaporation estimation, reservoir evaporation and methods for its reduction, evapotranspiration, measurement of evapotranspiration, evapotranspiration equations, potential evapotranspiration over India, actual evapotranspiration, interception, depression storage, infiltration, infiltration capacity, measurement of infiltration, modelling infiltration capacity, classification of infiltration capacities, infiltration indices.

Unit III: Runoff

Runoff volume, SCS-CN method of estimating runoff volume, flowduration curve, flow-mass curve, hydrograph, factors affecting runoff hydrograph, components of hydrograph, base flow separation, effective rainfall, unit hydrograph surface water resources of India, environmental flows.

Unit IV: Water withdrawals and Uses

Water for energy production, water for agriculture, water for hydroelectric generation; flood control. Analysis of surface water supply, Water requirement of crops-Crops and crop seasons in India, cropping pattern, duty and delta; Quality of irrigation water; Soil-water relationships, root zone soil water, infiltration, consumptive use, irrigation requirement, frequency of irrigation; Methods of applying water to the fields: surface, sub-surface, sprinkler and trickle / drip irrigation.

Unit V: Distribution systems

Canal systems, alignment of canals, canal losses, estimation of design discharge. Design of channels- rigid boundary channels, alluvial channels, Kennedy's and Lacey's theory of regime channels. Canal outlets: non-modular, semi-modular and modular outlets. Water logging: causes, effects and remedial measures. Lining of canals, types of lining, drainage of irrigated lands: necessity, methods.

Unit VI: Dams and Spillways

Embankment dams: Classification, design considerations, estimation and control of seepage, slope protection. Gravity dams: forces on gravity dams, causes of failure, stress analysis, elementary and practical profile. Arch and buttress dams.

Spillways: components of spillways, types of gates for spillway crests; Reservoirs- Types, capacity of reservoirs, yield of reservoir, reservoir regulation, sedimentation, economic height of dam, selection of suitable site.

Text/Reference Books:

1. K Subramanya, Engineering Hydrology, Mc-Graw Hill.
2. K N Muthreja, Applied Hydrology, Tata Mc-Graw Hill.
3. K Subramanya, Water Resources Engineering through Objective Questions, Tata McGraw Hill.
4. G L Asawa, Irrigation Engineering, Wiley Eastern
5. L W Mays, Water Resources Engineering, Wiley.
6. J D Zimmerman, Irrigation, John Wiley & Sons
7. C S P Ojha, R Berndtsson and P Bhunya, Engineering Hydrology, Oxford.

1	2	3	4	5	6	7	8	9	10	11	12
			X		X						X

7K408: ENGINEERING GEOLOGY

B.Tech II Year II Sem.

L	T	P/D	C
3	0	-	2

Course Objectives

Student shall be able,

1. To definebasic geological concepts from civil engineering point of view
2. To identifythe various physical properties of minerals and rocks
3. To understand the concept of structural geology
4. To understandthe significance of Geology as applied to Civil Engineering
5. To applythis knowledge in Civil Engineering projects such as dams, roads, tunnels and slopes
6. To acquire proper knowledge about natural geological hazards

Course Outcomes

After the completion of the course student should be able to,

1. Describe different concepts and terms used in Engineering Geology
2. Identify and explain various types of minerals and rocks
3. Apply the various concepts of Engineering Geology to civil engineering field
4. Examine and select the sites related to dams, roads, tunnels and slopes
5. Identify the hazards prior and able to take the necessary precautions
6. Knowledgeable about geological hazards

UNIT – I

Introduction

Definition of Geology, Engineering Geology. Importance of geology from Civil Engineering point of view. Importance of physical geology, petrology and structural geology. Case studies of failures of few civil engineering constructions, weathering of rocks and its effect on the properties of rocks, importance of weathering with reference to dams, reservoirs and tunnels. Earth structure- Lithosphere- Internal structure of the earthquake, Plate Tectonics.

Applications: For selection of sites and design for major structures such as dams, reservoirs, bridges, deep foundations for high-rise buildings, etc.

UNIT – II

Mineralogy

Definition of mineral, mineralogy, Importance of study of minerals: rock forming and ore forming minerals. Different methods of study of minerals.Study of minerals by physical identification method and their physical properties. Determination of Physical properties of following minerals: Feldspar, Quartz, Flint, Jasper, Olivine, Augite, Hornblende, Muscovite, Biotite, Asbestos, Chlorite, Kyanite, Garnet, Talc, Calcite. Study of ore forming minerals such as Pyrite, Hematite, Magnetite, Amethyst, Galena, Pyrolusite, Graphite, Magnesite, and Bauxite, Coral reefs.

Applications: To Identify the various minerals useful in design of foundations

UNIT – III

Petrology

Definition of a rock, petrology. Classification of rocks-Geological classification of rocks. Rock Cycle. Classification of igneous Forms, structures and textures of igneous rocks. Classification of sedimentary rocks, and its structures and textures. Classification of metamorphic rocks, its structures and textures.
Megascopic Study of Granite, Dolerite, Basalt, Pegmatite, Charnockite, Sandstone, Shale, Limestone, Gneiss, Schist, Quartzite, Marble and Slate.
Applications: To Identify various rocks useful for design of foundations.

UNIT – IV

Structural Geology

Out Crop, Study of geological structures associated with rocks such as folds, faults, joints, unconformities-their important types. Significance of Strike and dip in geological structures, shield areas and seismic belts, seismic waves, Richter scale, Precautions to be taken for building construction in seismic areas, Ground Water, water table, common types of ground water, springs, geological controls of ground water movement, ground water exploration.
Applications: In selection of site for major structures such as dam, reservoir, bridges, and high-rise buildings

UNIT – V

Importance of Geophysical investigations, Principles of geophysical methods. Importance of Electrical resistivity method and seismic refraction method from civil engineering point of view.

Geology of Dams, Reservoirs, Tunnels

Types of Dams, Importance of geological considerations in the site selection of dams, reservoirs and tunnels. Case histories of dams, geological factors affecting the water tightness and life of a reservoir. Purpose of tunneling, types of tunnels, over break, lining of tunnels.
Applications: Site selection for dams, life of reservoirs, planning of tunnels

UNIT-VI

Geological Hazards: Geographical aspects of earthquake, tsunamis and landslides. Disaster prevention mitigation and management.
Applications: Taking necessary measures when the disasters occur

TEXT BOOKS:

1. Engineering Geology By N. Chennakesavulu, McMillan India Ltd.
2. Engineering Geology by S K Duggal, H K Pandey Mc Graw Hill Education Pvt Ltd 2014.

REFERENCES:

1. Geology for Engineers and Environmental Scientists, Pearson.
2. Krynine & Judd, Principles of Engineering Geology & Geotechnics, CBS Publishers & Distribution.

1	2	3	4	5	6	7	8	9	10	11	12
			X	X							X

7AC95: Electrical and Electronics Engineering Lab

B.Tech II Year II Sem

L	T	P/D	C
-	-	2	1

OBJECTIVES: To Understand the fundamentals of electrical and applications of these in electrical appliances.

COURSE OUTCOMES:

1. Understand the performance of three phase induction motor.
2. Understand the different speed control methods of DC motor.
3. Understand the performance of DC motor with and without loading.
4. Understand the no-load characteristics of Dc shunt generator.
5. Understand the applications of superposition and reciprocity theorems in circuit analysis.
6. Understand the characteristics of PN-junction, Zener diodes, bipolar junction transistor and MOSFET.
7. Understand the applications of half wave and full wave rectifier.
8. Understand the applications of digital electronics.

Electrical Experiments

1. Brake test on 3-phase induction motor (performance characteristics).
2. Speed control of DC shunt motor by
   a) Armature Voltage Control .
   b) Field flux control method.
3. Brake test on DC shunt motor.
4. Swinburne's test on DC shunt machine.
5. OCC characteristics of DC shunt generator.
6. Verification of superposition and Reciprocity Theorems.

Electronics Experiments

1. V-I Characteristics of PN –junction diode.
2. V-I Characteristics of Zener –junction diode.
3. Half wave and full wave rectifier.
4. V-I Characteristics of Bipolar junction Transistor.
5. V-I Characteristics of MOSFET.

1	2	3	4	5	6	7	8	9	10	11	12
			X		X						X

7K471: FLUID MECHANICS LABORATORY

B.Tech II Year II Sem.

L	T	P/D	C
-	-	4	2

Pre Requisites: FM Theory

Course Objectives:
To give the student an exposure to various hydraulic devices and Pipe Flow.

Course Outcomes:
At the end of the course, the student will be able to:
1. Determine coefficient of discharge for orifice and mouthpiece.
2. Calibrate notches, venturimeter, orifice meters
3. Determine major and miner losses in pipes

List of Experiments:

1. Verification of the Bernoulli's theorem;
2. Calibration of Venturimeter and Orifice meter;
3. Determination of Friction Factor of Pipe line: Major Losses;
4. Determination of Losses due to Sudden Expansion and Sudden Contraction: Minor Losses;
5. Determination of Coefficients of Discharge for Rectangular, Trapezoidal and V-Notch;
6. Determination of Coefficient of Discharge, Coefficient of Contraction and Coefficient of Velocity Mouthpiece setup;
7. Determination of Coefficient of Discharge, Coefficient of Contraction and Coefficient of Velocity Orifice setup;
8. Calibration of Rotameter and Flow Nozzle meter;
9. Conduct Heleshaw Experiment;
10. Conduct Reynolds's Experiment to determine the Reynolds's number and type of flow.
11. Verification of Water Hammer Condition for Sudden Closure of Valve;

1	2	3	4	5	6	7	8	9	10	11	12
			X			X					X

7K472: ENGINEERING GEOLOGY LABORATORY

B.Tech II Year II Sem.

L	T	P/D	C
-	-	3	1.5

Pre Requisites: Engineering Geology Theory

Course Objectives:

The object of this lab is that to provide practical knowledge about physical properties of minerals, rocks, drawing of geological maps, showing faults, uniformities etc.

Course Outcomes:

At the end of the course, the student will be able to identify the various rocks and minerals depending on geological classifications

List of Experiments:

1. Study of physical properties and identification of minerals.
2. Study of physical properties and identification Rock forming minerals.
3. Megascopic description and identification of Rocks.
4. Megascopic description and identification of igneous rocks.
5. Megascopic description and identification of sedimentary rocks.
6. Megascopic description and identification of metamorphic rocks.
7. Structural geology problems simple strike
8. Structural geology problems dip problems (calculation of amount of true dip and direction).
9. Interpretation and drawing of sections for geological maps showing normal beds.
10. Interpretation and drawing of sections for geological maps showing tilted beds.
11. Interpretation and drawing of sections for geological maps showing fault beds.
12. Interpretation and drawing of sections for geological maps showing folded beds.

1	2	3	4	5	6	7	8	9	10	11	12
								X	X		X

B. Tech II Year II Semester
TECHNICAL SEMINAR –IV

Code: 7K491

L	T	P	C
-	-	2	1

Course Objective :

1. Develop ability to be a public speaker with the aid of Power Point Presentations.
2. Learn delivering technical seminars demonstrating clarity in thinking and enunciating complex technical concepts.
3. Practice and develop communication skills and interview performance skills.

Course Outcomes:

1. Demonstrate public speaking with the aid of Power Point Presentations
2. Identify current general and specific technological topics of interest and prepare and present the content cogently.
3. Demonstrate communication skills and interview performance skills

Procedure

1. Seminar in-charges shall highlight the significance of technical seminar in the first two sessions and enlighten the students on the utility of these seminars.
2. The slots, titles shall be decided upfront and seminar in charge shall take signatures.
3. The same sheet shall be affixed in the respective classrooms and seminar register.
4. Progress of the seminars is reviewed by the concerned HOD once in 15 days.
5. The evaluation for technical seminars is informed to students and displayed in the classrooms.
6. The presentation (PPT) must contain topic, introduction, explanation, diagrams, tables, applications and conclusions.

Distribution of marks

There shall be a Technical Paper writing and seminar evaluated for 100 marks in First Year Second Semester. The evaluation is purely internal and will be conducted as follows:

Content	: 20 marks
Presentation including PPT	: 20 marks
Seminar Notes	: 10 marks
Interaction	: 10 marks
Report	: 25 marks
Attendance	: 10 marks
Punctuality	: 5 marks
Total	**100 marks**

7K488: COMPREHENSIVE VIVA VOCE –I

B. Tech II Year II Sem.

L	T	P/D	C
-	-	-	1

Course Objectives :
Evaluate, comprehend and assess the concepts and the knowledge gained in the core courses of the first and the second year.

Course Outcomes :
At the end of this course, the student will be able to

1. Comprehend the concepts in the core and elective courses.
2. Exhibit technical knowledge to face interviews.
3. Exhibit lifelong Learning skills for higher education and to pursue Professional practice.

There will be 100 marks in total with 30 marks of internal evaluation and 70 marks of external evaluation.

Internal:
Comprehensive Viva Voce is Conducted twice in a semester and evaluated for 15 marks each.

End examination : 70 Marks.

The end examination will be carried out by a committee consisting of an external examiner, head of the department, a senior faculty member and the supervisor.